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Author: V. Zgodzinski

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An Account of Modern Psychological
Thinking on Language-Learning and
Bilingualism

Report Presented to the Royal Commission
on Bilingualism and Biculturalism

Vivian Zgodzinski

March 1966

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- B. Psychological Approaches to the Study of Language (Account of Research projects until 1963)
- C. Annual Progress Report to the Defence Research Board - 1965 (Account of Research projects of 1964, 1965)

I INTRODUCTION

Horace "Grammatici certant et adhuc sub iudice lis est"
- Ars Poetica—78

Doctors argue and the matter is still under judgement

During the summer of 1965 it was suggested that W.E. Lambert and Albert Morf should do a study on the Penfield hypothesis which favours early second language learning. The project was to have been coordinated by Professor W.F. Mackey. But, owing to the pressure of work, Lambert had to decline. Because the work of the three psychologists concerned is of such importance to language teaching, it was decided to do a review of their writings and try to isolate their main ideas. W.E. Lambert is a psychologist in the behavioral tradition, W. Penfield, a clinical neurologist and brain surgeon, A. Morf, a follower of the Swiss psychologist, Jean Piaget.

In their approaches to language, Lambert and Penfield agree while Morf takes a contradictory view. They all seem to be examining two different aspects of language. Each has contributed to different types of studies and has based himself on different premises. This is only natural: Morf's background is philosophy. He considers language as a manifestation of thought and a system of logical structures. For Lambert and Penfield, language is to be studied as a form of behavior.

It can be said that Lambert, Penfield and Morf each use language as a tool for their own field of research. Penfield studied the effect of stimulating the cortex on thought and association, and compared aphasia cases of adults and children. Thus, he examines speech as neurological activity. Lambert specialized his department at McGill in studies of language behaviour of bilingual and monolingual adults and children.

Morf, a disciple of Piaget, does not deal with bilingualism or even language as such, but with the development of logical structures. However, as they consider structures of speech to be good evidence of thought structures, Morf and Piaget have minutely recorded and analyzed the speech of children.

Thus, while Lambert and Penfield examine the finished product, Morf is interested in the process of language formation.

With such contrasting approaches to language, it should not be surprising to find our three psychologists in disagreement on questions of second-language teaching. One issue which divides opinions neatly into two opposing camps is that concerning the age at which second-language learning should start. Penfield and Lambert strongly believe, that the sooner the child is exposed to another language, the better. The best age to start teaching a 2nd language at school would be from 5 to 7. Morf, working from his own studies and those of Piaget, warns that if a child learns a second language before 12, he runs the risk of not having a firm foundation for logical thought.

When talking about the process of learning a language, Penfield and Lambert mostly refer to the problems of vocabulary acquisition (could this be why Lambert only experiments with vocabulary learning?). Morf is mainly interested in the acquisition of grammatical structures, and believes that to be the most important aspect of language learning. During interviews, Morf remarked that Lambert does not examine the deeper problems of bilingualism while in his turn Lambert questioned Morf's experimental procedures and proofs.

However, in spite of these seemingly irreconcilable differences, there are some aspects of second-language teaching on which the two camps agree. During an interview Morf deplored some methods used today in teaching children to older children a second language. Methods of teaching, he said, should be adapted to the age level. At 12, or more, a child is interested in comparing grammatical structures and not in the repetition, as in for example, in vocabulary drills. Lambert has not criticized existing methods of teaching so directly, but he has remarked that his studies on semantic satiation, which show that repetition of a word leads to a decrease in its meaning value, could mean that vocabulary drills may not be too effective.

Also, in an article summarizing his own research, Lambert suggested that method be adapted to the age-level of the second-language learner. The audio-lingual direct method may be appropriate for younger children but for older subjects, it may run counter to ability patterns developed over many years.

Such an agreement might have important implications for second-language teaching.

After discussing their work with Lambert and Morf, I summarized the articles they recommended, then had the summaries checked in further interviews. Dr. Penfield, unfortunately, was unavailable for interview, but he was good enough to give us reference to what he considered his most important articles. Included in this section are two theses by students who conducted some experiments on problems raised by Penfield.

The most extensive interviewing and research was done with Dr. Lambert. The interviews, however, did not add much to the research material except for the emphasis that all the findings are tentative. Lambert was very cooperative in giving us access to all of his articles which dealt with the topic, as well as some theses written by his students.

Piaget's work was studied mostly as background material for interviews with Morf. Due to a shortage of time, only some appraisals of his work from other sources are presented here.

Interviews with Professor Morf provided more information on the topic than the articles which he wrote. One article, is fully summarized, however, as it is a good example of Morf's and Piaget's technique in studying the thought-development of the child. It includes, as well, much of their theories on language. One part of another article is quoted as it provides some background theories.

This study is divided into three parts:

- 1) Penfield and his followers
- 2) Lambert and students:
 - a) measurement of attitudes by the matched guise test
 - b) the importance of attitude as well as aptitude for second-language learning
 - c) bilingualism per se - measures and types of bilingualism
 - d) language per se - mainly semantic satiation
 - e) an article in which Lambert gives an account of background theories

Within each group the articles are placed in a logical order, and not according to the year in which they were published

- 3) Morf - summaries of Piaget, an account of an interview with Morf, a summary and a quote from two articles written by Morf.

A general index is given at the end.

II WILDER PENFIELD

1. 2 articles by PenField
2. Switching mechanism
3. Kindergarten in a second language

Penfield, Wilder

1. A consideration of the Neurological Mechanisms of Speech and some Educational Consequences

Proceedings of the American Academy of Arts and Science.

1953, Vol. 82, No. 5.

2. Conditioning the Uncommitted Cortex for Language Learning

Brain,
1965, Vol. 88, Part IV.

Reasons for early language learning

Neurological evidence and day-to-day experience point to the fact that a child's brain is more plastic than an adult's as far as the localization of speech is concerned. After a shock causing aphasia a child can recover speech, perhaps in a few months, while the adult may never speak again. Children of immigrant parents pick up the language of the new country in very little time and will speak it fluently, without an accent, while their parents have a great deal of difficulty. If they do master the new language the adults will speak it with an accent.

From the ages of 5 to 10 the brain is physiologically well-adapted for learning languages. At birth there is an extensive area of the brain which is not programmed for any sensory or motor function. This uncommitted area is used later for speech and interpretation. Up to the age of ten part of the uncommitted cortex is being programmed for speech sounds. After that age the functional connections become fixed; there is then

a rapid expansion of vocabulary, a multiplication of perception and development of reasoned thought.

When the uncommitted cortex is conditioned early to the speech sounds of more than one language system, the child can learn other languages more easily later. If he forgets his second language he can easily pick it up again. Also, bilinguals have a switch-mechanism type of conditioned reflex which separates the two languages. Hearing a French word or meeting a French person the French/English bilingual will automatically switch to his French network with its vocabulary. The rapidly acquired switch mechanism protects the child from the confusion which some people say results from learning a second language too early, and the earlier this mechanism is acquired, the more automatic it can become.

Method

A child learns the first language by direct method; he does not see it as an end to itself but as a mean of getting what he wants. He can in the same way and just as easily learn to speak several languages. Penfield's children learned to speak German with their governess, French in nursery school and English with their parents.

From kindergarten to grades three or four a child could attend a class conducted entirely in a second language, and then pick up courses at his level in his first language. Parallel bilingualism, with one language in the morning and the other in the afternoon could be effective. It is used in

a school in Montreal that teaches children from 4 to 6 years old. They then continue courses in either French or English at their appropriate level. Or parents could follow the technique of one bilingual mother who established the upstairs part of the home as the French speaking area and the downstairs for English. The direct method is the way the child learns his first language and it is the most efficient method of learning a second language.

Preston

Inter-Lingual Interference
In a Bilingual Version of
The Stroop Colour-Word task

1965, Ph. D. Thesis. McGill University.

Object of Experiment

To what degree and at what points do two language systems overlap? Penfield has suggested that there is a switching mechanism which effectively shuts off one language system while another is in operation. Such a theory could be examined by structuring a situation which would activate two potentially interfering systems in two languages.

The Stroop colour word tests examines the interference between two sub-systems in one language. It involves three tests

- 1) reading names of colour words printed in black ink,
- 2) naming colours of patches or blocks
- 3) naming the ink colour of colour words. (e.g. the blue ink colour of the word "red")

The third test always took the most time to complete.

The author of this paper attributes this result to the activation of two interfering sub-systems-colour naming and word-reading. He then suggests that one way to explore interference between two language systems would be to have a bilingual Stroop colour task, in which word reading and colour naming are done in two languages, and compare the amount of interference (measured by time required for completion, and by number of errors) to that found in the monolingual colour naming task.

Experiment

Subjects were asked to name English cards in English or in French and French cards likewise. They were also asked to name patches of colour in the two languages.

The results of monolingual subjects (given the standard Stroop test) were compared with results of "balanced" bilinguals (equally fluent in both languages) and "dominant" bilinguals. (More fluent in one language). Other variables studied were: low frequency words versus high-frequency (often used) words; colour versus non colour words.

For the sake of brevity, the results are summarized in tabular form.

Results:Study 1Monolingual Subjects

Slightly

<u>More interference with</u>	<u>than with</u>
high-frequency words	low-frequency words
← non-colour words →	

Considerably

<u>More interference with</u>	<u>than with</u>
colour words	non-colour words
← same frequency →	

Study 2 & 3Balanced Bilinguals Subjects

Slightly

More interference withthan withresponse & interfering
language differentresponse & interfering
language the same[If the characteristics are different
e.g. black-schwarz]Study 4Dominant Bilingual SubjectsLess interference withthan with

- (1) interfering &
- (2) response words both
in non-dominant language

response word - dominant
languageresponse word in non-
dominant languageresponse & interfering words
both in dominant languageresponse & interfering
words both in non-
dominant language

" "

" "

response word in non-
dominant languageinterfering words in
dominant language.Time scores

- 1) word-reading in non dominant
language response dominant
- 2) response & interfering in
dominant language
- 3) colour naming in non-dominant
language

(1) interfering - the word printed(2) response - name of the colour of the ink

Conclusion

- I The importance of three factors:
- 1) ability to decode words
 - 2) ability to label a colour quickly
 - 3) facility in oral production -

 Seems to vary with the degree of language dominance of the bilingual. As a dominant bilingual becomes balanced, weights of these factors change, yielding a different pattern of results in the bilingual Stroop tasks.

- II The findings of this experiment provide little support for Penfield's hypothesis of a switch mechanism that effectively shuts off processes functioning in one language system while another is used. It seems, rather, that while colour naming is occurring in one language, processes involved in decoding words in the other language and translating processes are activated.

Timothy Hogan

The Influence of Second Language
Learning on Maternal Language and
School Readiness

1965, PHD thesis, University of
Ottawa

Object of Experiment

Penfield, in advocating the direct method of teaching, suggested that a child could attend a class in a second language for a year and could then continue in his own language, at his proper level. Would this not affect the first language development as well as the educational progress of the child? More specifically, what influence would a year in a second language, say at kindergarten level, have in

- 1) vocabulary discrimination and comprehension in the first language?
- 2) readiness in the first language, for reading, spelling, and arithmetic?

Subjects

The experimental group consisted of fifteen six-year-old boys and girls. Their first language was English and for a year (1964-65) they attended a kindergarten class conducted entirely in French. The control was made up of

- a) children who had attended an English kindergarten in the same school a year earlier and
- b) records of 150 other normally taught children.

Results

Results of the tests given to the control class of 1963 and the experimental class of 1964 showed there was no statistical difference between the two groups in

first language development
arithmetic readiness
perceptual ability

There was however a difference in reading readiness: the experimental group was lower.

Conclusion

On the whole, it seems that teaching at kindergarten level in a second language does not have a harmful effect on the child's development.

Penfield foretold this, but he has not given too much explanation beyond saying that the child's brain is more plastic and that he has a psychological urge to learn as much as possible. The theories of Werner and Kaplan on synonymy might provide a partial explanation. They say that from five to seven the child ties together his experiences, linking events and establishing relationships. He also learns to use different terms for one referent, varying according to the addressee. He will know how to use one term with one person and another for the same concept with a different person. He is beginning to explore synonymy in which the inner form of the symbolic vehicle or the ^{referent} conceptual

is not altered when there is another external form. Speaking another language involves the same problem. The child from 5 to 7, exploring his newly found ability for synonymy could thus easily learn a second language.

III LAMBERT

1. Reactions to spoken language
2. Importance of attitude to 2nd language learning
3. Measures and types of bilingualism
4. Effect of repetition on meaning
5. Summarizing article by Lambert

Reactions to spoken Language:Introducing the Matched Guise
Technique

Lambert, Hodgson, Gardner and Fillenbaum

Evaluational Reactions to Spoken
Languages

Journal of Abnormal and Social
Psychology,
1960, Vol. 60, No. 1.

Spoken language is one of the features which identifies members of a national or cultural group. The particular language or accent of a speaker evokes in the listener the stereotyped attitude he has toward the speaker's language group, and this influences his judgment of the message itself, regardless of its content.

Object

To determine the significance of spoken language by examining evaluational reaction to English and French voices.

Experiment

To minimize the difference in evaluation caused by the voice of the speaker and the message, bilingual speakers read the same message in both languages. The subjects of the experiment, however were told 1) that they would hear ten voices reading the same message in English

and French 2) that the purpose of the study was to determine the extent to which character judgment are influenced by voice alone. They were not told that they would be hearing the same voices twice. The assignment was to rate each speaker for 14 traits (such as height good looks, ambition) on 6-point scales ranging from very little to very much.

e.g. tall -| -| -| -| -| - short

Subjects

The subjects (listeners) were English and French 18-year-olds studying at McGill and at a classical college in Montreal.

Speakers

The speakers were fluent bilinguals but two spoke French with a normal French Canadian accent, one with an exaggerated French Canadian accent, typical of people "in the bush" and the other with a European-French accent.

Results

Reactions of English listeners:

English speakers are: taller
 more good-looking
 " intelligent
 " self-confident
 " dependable
 ambitious

and have more character and leadership qualities.

Reactions of French listeners:

English speakers are: taller
 more good-looking
 have more leadership
 " intelligent
 " self-confident
 " ambitious
 " sociable
 " likeable

have more character and leadership qualities.

-French subjects were more favorable than the English subjects to English guises of speakers.

Discussion

Possibly the list of characteristics omitted those which have value for French Canadians. However, French subjects chose dependability, intelligence and kindness as the most desirable traits for friends, and they rated the English guises more favorably for the first two.

The authors suggest that because there are more English people in powerful social and economic positions, English and French subjects probably associate English speech with higher status, and thus find that the English speaker is more ambitious, intelligent etc. However other data seem to contradict this theory. When experimenters asked for the subjects' estimation of each speaker's likely occupation, the French subjects ascribed higher-status occupation to a larger proportion of French guises than did the English subjects.

The speaker with a European French accent was not as downgraded as the other French speakers; which confirms a rather well known fact, that Montrealers have different attitudes towards French-Canadians and French people from Europe. Moreover the speaker that spoke with a caricatured French accent was particularly downgraded by both English and French subjects. The more the French subjects favored towards their own group, the less they overrated the English guises.

Answers to attitude Questionnaires

Answers to standard questionnaires did not correlate with evaluation reactions to matched guises. This is taken by the experimenters as proof that the matched-guise technique taps only community-wide stereotypes. Even those English subjects with favorable attitudes toward the French would perceive them as inferior on many traits. Likewise French subjects with negative attitudes towards the English would think of them as superior in many respects. The attitude factor would to this extent, be submerged by the powerful community-wide stereotype.

Conclusion

Reactions obtained by the matched guise technique suggest that the French Canadian people have a minority group reaction in their acceptance of the stereotyped opinions of the majority group.

E. Anisfeld and Lambert

Evaluational Reactions of Bilingual
and Monolingual Children to Spoken
Languages

Journal of Abnormal and Social
Psychology, 1964, v. 69, no. 1,
pp. 89-97.

Object

To examine the stereotypes held by French-Canadian children and to compare them with those held by adults.

(See previous study)

Subjects

The subjects were 150 10-year-old bilingual children of Montreal.

Speakers

The voices belonged to four 10-year-old bilingual girls, each reading the same passage in English and French.

Two of the speakers had a European French accent in French, and the other two, French-Canadian.

Experiment

Each voice was rated by the subjects on the same character traits as such in the previous studies. (III, 2,i).

Results

1) The children showed a generalized negative attitude to the English. The French guises were rated more favorably for everything except height. French Canadians are on the average shorter than the English so this may simply be a realistic observation.

The results of this experiment confirms the hypothesis that children go through stages in learning prejudiced attitudes, the 10-year-old child rejecting all members of another group.

However, almost all the favorable evaluations of French over English are attributed to the ratings made by French monolinguals; bilinguals saw much less difference between the two groups. In addition, other attitude measures show that the bilinguals identify themselves more closely with the English.

2) The bilinguals saw more differences between the European French and English voices than between the French Canadian and English. The monolinguals on the whole saw more differences between the French Canadian and English guises.

3) Parental attitudes contributed to the stereotypes the children held of their own group and of the English. The bilinguals' parents seem to have encouraged contacts with English children. Thus, having had an

opportunity to meet members of the other group at an earlier age, the bilingual children would less likely adopt the French community stereotype about "les Anglais". The bilinguals may have matured earlier in their attitudes as well, since, in general, their ratings are more specific to individual speakers.

Discussion

The findings of this study contrast sharply with those obtained with adult French Canadians who evaluated English speakers more favorably. It would be interesting to study several age levels with the matched guise technique to determine when this reversal happens.

As the French Canadian child grows older and comes into contact with the English community, he is probably made to feel more and more inferior. At ten he is still under the influence of his home and his particular cultural environment; his world is not much bigger than his own community. But as he grows older, he may become more sensitive to the overall climate in a city such as Montreal where he may be discriminated against because he is French.

Frankel and Lambert

Evaluational Reactions of French-Canadian
Children to the Matched Guises of French-
English Bilingual Speakers

1965 McGill University

Object

To determine when and how an inferiority feeling for their own ethnic-linguistic group first shows itself among young French Canadians.

Subjects

French-Canadian girls from Montreal were separated into age-groups of ten, twelve, fourteen and sixteen. They were further classified as: bilingual or monolingual; attending public school or private school.

The girls from the private school were evidently of a higher socio-economic background than those from public schools.

Speakers

The speakers were male and female bilinguals who ^{were} ~~are~~ either adult, or the same age as the judges themselves.

Results

Three variables in the subjects' background influenced their evaluation of the speakers.

- a) The type of school the subject attended - which indicates in this case their social-class background.
- b) The age of the subjects.
- c) Their bilinguality - that is, their skill with English.

The results for the monolingual girls from the public schools were varied and can best be summarized in a tabular form.

When evaluating female speakers of their own age at

age 10 - no favoritism between EC and FC guises

12 - moderate pro-French Canadian bias

14 - moderate English-Canadian bias

16 - moderate French-Canadian bias

when evaluating adult female speakers

age 12 - English-Canadian bias

14 - English-Canadian bias

16 - no preference

when evaluating male adult speakers

age 12 - pro French-Canadian

14 - slightly pro English-Canadian

16 - no preference.

The bilingual girls from public schools showed a similar pattern of results. But, up to the age of 16 they had a pro-English-Canadian bias for the speaker of their age. They also maintained a slight bias for French Canadian male speakers into the later teen years.

There was a sharp contrast in the evaluations of the private school girls. They strongly favored the English-Canadian guises of speakers their own age, of adult women, and, though to a less marked degree, of adult men. The bilinguals, from the private schools were more strongly pro-English-Canadian than the monolinguals from the same school.

Discussion

The authors suggest that the upper middle class subjects came from homes where English-Canadian standards are accepted, these being the people that have greater economic and social power in the community.

Or, the results can also be analyzed from a psychodynamic viewpoint, The French-Canadian male speakers for example were not as downgraded as the female speakers.

Public school monolinguals generally favored the French-Canadian guises. Private school monolinguals showed a marked rejection of themselves since they favored the English guises. Presumably bilinguals can consider themselves

as being members of both linguistic groups. Both public and private school bilinguals seem to favor the English-Canadian version of themselves.

Conclusion

Definite preference for English-Canadian guises appeared at about age 12 and was maintained through the late teen years by French-Canadian girls, especially by the bilinguals who came from upper-middle-class homes and attended private schools.

The authors emphasize that these results and hypotheses must be verified by further research.

Preston, M.S.

Evaluational Reactions to English-
Canadian, French and European
French Voices

McGill M.A. thesis, 1963.

Object

Examining again the stereotypes the English and French Canadians have of each other, the author was interested in assessing the importance of the following variables:

- 1) the sex of the listeners
- 2) the sex of the speakers
- 3) reactions to speakers of French Canadian compared with reactions to speakers of standard or Parisian French
- 4) reactions due to individual speaker's characteristics (group stereotypes).

Subjects

The subjects were first year university students from McGill and University of Montreal.

Experiment

The subjects (or listeners) were asked to evaluate 16 voices on personality traits grouped around:

- 1) competence - intelligence, ambition, leadership
- 2) integrity - dependability, kindness

- 3) social attractiveness - sociability, entertainingness
- 4) some traits which did not fit into the above three - such as religiousness, good looks, height.

Speakers

The voices belonged to eight bilingual men and women. Two men and two women spoke French-Canadian, when they used their French guises, while the other two spoke with a standard French accent (referred to as French-French).

Speaker difference

Differences due to characteristics of individuals were important. Both English and French Canadian listeners tended to rate one speaker above the other, when all other variables (language, accent) were the same. Thus, impressions of a speaker's personality would depend on the vocal and phonological characteristics of his voice as well as the associations linked with the dialect he is speaking.

English Canadian reaction

English Canadians made very few distinctions between the English-Canadian and French-French speakers, while there was a sharp English-Canadian / French-Canadian contrast. French-French people were neither downgraded nor taken as potential social models. It may be that English Canadians are less involved emotionally and motivationally with French-French people and therefore less concerned or interested in them.

Simplified Chart & Summary of Hypotheses

← L I S T E N E R S →

	E.C. Female	E.C. Male	F.C. Female	F.C. Male
E.C. Female	-	-	+ potential	+ inavailability
E.C. Male	+ ↔	+ majority group's acceptance of stereo-type	-	+ minority group stereo-type accepted eval. of majority higher
F.C. Female	+ difference(?)	+ inavailability (?)	-	-
F.C. Male	-	-	+ more value of F.C. culture	-
F.F. Female	~	not much contrast ~	+	+
F.F. Male	~ (indifferent)	~	+	+(potential social models)

Legend ~ no bias for one group or another

- unfavourable

+ favourable

F.C. French Canadian

E.C. English Canadian

← S P E A K E R S →

French Canadian Reactions

Reactions of the French Canadian listeners seems to depend on:

- 1) sex of listener
- 2) sex of speaker
- 3) kind of comparison being made - English-Canadian/
French-Canadian or English-Canadian/French-French.

The male French-Canadians saw their own linguistic-cultural group as inferior to both the English-Canadian and French-French groups. The French-Canadian women favored the FC male guises which suggests that they may place more value on French-Canadian culture, and thus may play a role in its preservation. This preference for French-Canadian values by females is probably passed on to their families through language, religion and tradition.

Conclusion

If this study is compared to one made in 1960, (III, 2, i) an interesting change can be seen. The French Canadian males viewed the EC males as superior on only 4 traits in this study - height, intelligence, leadership and character. Notably absent are ambition and self-confidence. In the previous study FC males viewed EC males as taller, better looking, more intelligent, self confident, dependable, ambitious, sociable and likeable. This may indicate that

the views the French-Canadian has of himself are improving, probably as a result of rapid social change in Quebec and the rise of French Canadian nationalism. However these indications are so slight that firm conclusions can not be drawn.

Anisfeld, Bogo and Lambert

Evaluational Reactions to Accented
English Speech

Journal of Abnormal and Social
Psychology, 1962, 65, 223-231.

Object

Evaluation reactions of English and Jewish subjects to English spoken with a Jewish accent in comparison with reactions to "pure" English.

Subjects

Students enrolled in second and third year psychology courses at McGill. Most of the Jewish subjects were born in Canada.

English reactions

English guises rated more favorably for:

height;

good looks;

leadership.

The English subjects did not rate English-Jewish guises more favorably on any trait.

Jewish reactions

English guises more rated favorably for:

height;

good looks;

leadership;

English-Jewish guises rated more favorably for:

entertainingness;

sense of humour;

kindness;

Jewish subjects granted Jewish immigrants a better sense of humour, entertainingness and kindness in comparison to non-Jews, but not when compared to native Jews (themselves). Also, Jewish subjects seemed to agree that the accented guises of Jews showed less self-confidence when compared to those of native Jews, but not when compared to those of non-Jews.

Questionnaire versus matched guise technique

Subjects were also given a questionnaire on attitude scales. The answers to these did not correspond with results of matched guise tests. This lends support to the proposition that the matched-guise technique taps stereotypes rather than attitudes. Also it seems apparent that subjects did not respond emotionally to the task of judging speakers. They took it as an intellectual challenge, using whatever information was available to them; and the main source seems to have been community wide stereotypes about people with accents, i.e. immigrants.

Conclusion

Any person with an accent, was evaluated as shorter, less good looking and lacking in leadership qualities.

Accented voices probably aroused certain reactions which have been acquired through previous experiences with people who speak English with an accent, and accented voices were perceived generally as those of immigrants. Immigrants would not be expected to occupy positions of leadership; therefore they might be considered to have few leadership qualities. The finding that speakers with accents were thought of as shorter and less good-looking was less easy to interpret. It has been suggested by previous research that magnitude is closely associated with value. Thus immigrants who are usually relegated to low status roles would be regarded as short and comparatively unattractive. Unless there is the possibility that attribution of shorter stature to immigrants has some factual basis.

The fact that Jewish students have more favourable self-images than gentile students suggests to the authors Jewish students as minority groups members may have a greater need for self-glorification. Or since there is a great emphasis traditionally placed on intellectual achievement in the Jewish tradition, Jewish persons attending college may enjoy more prestige in their families and social circles than do gentile students. Or the Jewish students may have used the accented guises (interpreted to be of Jewish immigrants) as a reference point and have upgraded themselves

in comparison. In any case the results of this study casts doubt on the generality of Jewish self-hatred. The opposite phenomenon is known to be not uncommon. A Jewish observer can readily detect an important sense of pride in being Jewish on the part of a great many Jews.

These findings contrast with those of the French-English study. The French-Canadian subjects have apparently adopted derogatory stereotypes assigned to them by the English majority, evaluating members of their own group as superior only in kindness and religiousness. They also had less favourable reactions to the French Canadian guises than did the English subjects. In contrast Jewish students appear to have adopted positive stereotypes concerning Jews, even for Jewish immigrants.

Lambert, Anifeld and Yeni-Komshian

Evaluational Reactions of Jewish
and Arab Adolescent to Dialect
and Language Variations

Journal of Personality and Social
Psychology. July, 1965, Vol. 2,
No. 1.

Object

- 1) Reactions of Ashkenazik Jews (born of European parentage) to¹ Yemenite Jews (of middle Eastern parantage).
- 2) Reactions of Arabs and Ashkenazik Jews to each other.
- 3) Comparison of the matched guise technique results to answer to attitude questionnaires.

Subjects

The subjects were 14 to 16 year old Jewish and Arab students. The Jewish subjects were mostly born in Israel of European parentage, i.e. Ashkenazic. The Arab subject were more bilingual in Arab and Hebrew than were the Jewish subjects. The standard attitude questionnaire was only given to the Jewish subjects.

1. Yeminite also called Sephardic.

Results of matched guise technique

The Ashkenazic Jews considered the Yemenite Jews (in comparison with themselves) as less intelligent

- " ambitious
- " wealthy
- " socially acceptable
- " honest and reliable

but having a greater sense of humour. The same subjects rated Arabs as less friendly

- " honest
- " desirable as friends or
marriage partners.

Arabs were generally downgraded in everything except for wealth which may have been interpreted in terms of greater of land possessions of the Arab countries. The Arab subjects considered members of the Jewish group as:

less intelligent

- " self confident
- " dependable and
- " desirable for marriage partners.

They would also be more willing to help members of their own group in time of need. Evidently, Jewish and Arab subjects responded to representatives of one another's group in mutually antagonistic manners.

Attitude Questionnaires

In the answers to attitude questionnaires Yemenite Jews were considered more interesting, friendly and good-natured, while in the matched guise ratings they were considered less honest, intelligent, reliable, similar in friendliness and good looks, and more self-confident and leaderlike than Ashkenazic Jews. Similarly in the attitude ratings Arabs were considered less good looking, intelligent, self-confident, reliable, whereas the view in the guise ratings was that Arabs were less honest and friendly-but not reliably different as far as appearance, leadership, intelligence, self-confidence or reliability was concerned.

Conclusion

The contrast between answers to attitude questionnaires and the results of the matched guise technique may be partly due to procedural differences between the two methods. The matched guise technique directs attention primarily to individuals who, because of their language style, are representatives of a particular linguistic and ethnic group. The attitude questionnaires direct the subjects' attention to an ethnic or national group as a whole. Moreover, in answering standard questionnaires on attitudes, subjects understand what is being measured and can easily distort their attitudes by responding in what they feel is a

socially appropriate manner. The matched guise technique would probably hide the true purpose of the procedure. The authors suggest that the matched guise technique, in contrast to standard questionnaires on attitudes, evokes more private emotional and conceptual reactions.

ATTITUDE PLUS APTITUDE =
ACHIEVEMENT

or

THE IMPORTANCE OF ATTITUDE
TO 2nd LANGUAGE LEARNING

Gardner

Social Factors in Second - Language Acquisition

1958, McGill M.A. thesis

INTRODUCTION

Previous research has shown that a general linguistic aptitude is important in learning a second language. Results of aptitude tests however, do not give perfect prediction of achievement in second language learning. This suggests that other factors such as interest, motivation, effort expended, are also involved. These "social factors" are defined as those characteristics which would motivate the subject to expend the energy necessary to acquire verbal symbols of another culture, and thus facilitate inter-personal relationships.

DEFINITIONS

- 1) Integrative motivation: Learning the second language because of an interest in, a favorable attitude to, or a wish to be part of another cultural-linguistic group.
- 2) Instrumental motivation: Learning the second language for the advantages to be gained, either socially or economically.

Integrative motivation should manifest itself in positive scores on tests of attitudes toward the outgroup, low scores on tests of ethnocentrism (general suspicion of outgroups)¹ and other measures of prejudice towards specific outgroups. The second type of integrative motivation, in which the person wants to belong to another group because of dissatisfaction of his own, should show in tests measuring in-group disaffection such as Srole's Anomie Scale (1951).

Also, the reasons a student gives for his studying a second language indicate an integrative or instrumental motivation. An instrumentally motivated person might state that he wants to learn French in order to benefit himself either financially or in terms of prestige. An integratively motivated person would say he wanted to gain access to the French-speaking group, either to enlarge his circle of acquaintances or to gain a better understanding of these people.

It would also be important to measure the intensity of motivation. It is here defined in terms of effort subjects would expend to improve their knowledge of French. Three studies explore the importance of these social factors in second language learning.

1. Such as California F - Scale (Adorno et al, 1950)
E- Scale (Adorno et al, 1950)

Study I

Object: To try out standard and original tests of social motivation and to examine the relationship between these motivations and student's progress in French.

Experiment: Subjects were given questionnaires of motivations and attitudes. The results were studied in relation to their final grades in French.

Subjects: Adults attending French extension courses in McGill. They were classified in three ways.

- 1) beginners / advanced
- 2) conversationally oriented / non-convers. orient.
- 3) drop-outs / completors

Students could choose between classes that stressed grammar training to facilitate reading and writing, or oral-aural training for those interested in conversation. The latter are thus classified as "conversationally" oriented. The completors were those who attended the course until the end of the year.

Results: Advanced students were less authoritarian than beginners. The available data cannot show whether this means that those who are initially less prejudiced would be more likely to continue in their study of languages or whether language experience causes a decrease in ethnocentric attitudes.

The conversation group has a more positive attitudes towards the French Canadians than the non-conversationally oriented. They also appeared to be more anomic.

Experiment

The students' scores on intelligence tests were obtained as well as their grades in French grammar, comprehension and translation, and English comprehension and literature.

Results

Motivational intensity was the only test which correlated with achievement. Intercorrelations between measures of achievement in French and English and intelligence tests suggest that achievement on the first language is important for success with foreign languages.

Study 3

Comparing the relative importance of social and motivational factors and aptitude for achievement in French

Subjects

English-speaking boys and girls of Montreal in grade XI.

Results

Social motivational factors including intensity and orientation correlated with achievement in French. Aptitude and motivation were found to be independent but equally important factors.

Conclusion

Two components are important for second language acquisition - aptitude and motivation. Instrumental motivation appeared to be more characteristic of adults, as there was no sign of it in the study of high school students. The social motivational tests might not have been adequate for high-school students and would need some modification for that age-group.

Motivational Variables in Second-
Language Acquisition
Canadian Journal of Psychology,
1959, Vol. 13, No. 4, pp. 266-272

Introduction - earlier research

According to Mowrer a child is motivated to learn his first language by his desire to be like valued members of the family, and later like members of his whole linguistic community. Ervin suggests that emotional dependence or respect for another individual may account for success in second-language learning. In other words a desire to be like or be part of a linguistic community is one important reason for learning a language. An individual acquiring a second language adopts certain behaviour patterns characteristic of the other cultural group; and his attitudes, favorable or unfavorable, towards that group determines his success in learning the new language.

Object

To determine the separate importance of linguistic aptitude and motivational variables in second language learning.

Subjects and Experiment

Tests were given to English-speaking grade XI high school students, measuring linguistic aptitude, verbal intelligence and various attitudinal and motivational characteristics.

Results

Analysis of the inter-correlations of these tests showed that two factors are equally important for grades in French - aptitude and motivation.

The integratively oriented students were more successful in acquiring French than were the instrumentally oriented. Also, the integratively oriented had more favorable attitudes towards members of the French group.

Conclusion

The correlation technique did not allow for complete verification of the authors' hypothesis: - a strong motivation to learn a second language follows from the desire to be accepted as a member of the other linguistic community. However the motivational factor was found to be important. Therefore, tests of verbal intelligence, motivation, intensity of motivation and one index of linguistic aptitude should give maximum prediction of success in second language learning.

Gardner

Motivational Variables in Second-
Language Acquisition

1960, PhD thesis, McGill University

Object

To examine the variables related to motivation in second-language learning, particularly to integrative motivation.

Subjects and Experiment

Grade 10 high school students of Montreal were given tests measuring language aptitude, orientation toward the French group and French study, skill in French some background characteristics. All students were English-speaking. One third were "superior" students in French (according to the teacher and principal) another average and another poor.

The term "French Canadian" was used in this study to make subjects think in terms of the language group with which they came into contact. Although standard French is taught in school, it can be used without difficulty in the province of Quebec. It may be true that a few subjects were motivated to learn French because of their interest in the European French community. Inclusion of these subjects would reduce the relationships of the integrative motive with the variables of skill.

The drop-outs showed as much motivation as the completors and they had more favourable attitudes to French-Canadians. This could be because drop-outs were interacting directly with French-Canadians making class attendance superfluous. It could also be that the drop-outs, having more favourable attitudes towards French-Canadians, would be uncomfortable in a class where the stress would be on standard European, in contrast to Canadian, French.

Intercorrelations between social factors

Prejudice was related with authoritarianism for beginners but not for advanced students. Ethnocentrism was negatively correlated to favourable attitudes towards French Canadians. This confirms previous findings. The positive correlation between F-scale and motivation was unexpected. This could mean that some ethnocentric individuals want to learn a second language in order to gain control over the second language group.

Study 2

Object of Experiment

Examining the correlation of social-motivational variables and achievement in both French and English.

Subjects

Grade eleven boys from Montreal taking French course. (In the Montreal Protestant school system French is a compulsory continuation subject from Grade 3.)

<u>Results</u>	<u>was associated with</u>	<u>Conclusions</u>
I. Comprehension	1) desire to learn language 2) favorable attitude to other language group 3) desire to meet with and understand speakers of other language	a relatively passive skill but highly dependent on a genuine interest in members of other linguistic community.
II. Vocabulary grammar	1) desire to learn language 2) willingness to associate with members of the other language group 3) amount of energy expended in learning the language	
III. Meaningfulness	1) desire to learn language 2) effort expended	
IV. (big) Meaning seperation	1) unfavorable attitude 2) unwillingness to learn the language	See parag. 1



<u>Results</u>	<u>was associated with</u>	<u>Conclusions</u>
V.	1) desire to learn Fr.	
Reading accent	2) effort expended	
pronunciation	3) interest in meeting Fr. people	
<hr/>		
VI.		
Ethnocentrism		a rigid in-group/out-group dichotomy maintained.
Authoritarianism	poor accent	Incapability to acquiring speech characteristics of language of the out-group.
<hr/>		
VII. Accent	integrative motive	see parag. 3
<hr/>		
VIII.		
Aural		
comprehension		
grammar	aptitude	see parag. 1
reading		
pronunciation		
<hr/>		



<u>Results</u>	<u>was associated with</u>	<u>Conclusions</u>
IX. favorable evaluation of: father early home life	effort to learn English amount of meaning separation	
X. Anomie	amount of home discipline integrative orientation	see parag. 4
XI. Ethnocentrism authoritarianism anomie	favor. attitude to mother poor accent little desire to learn Fr.	
XII. Student's integrative orientation	parent's integrative orientation	see parag. 9

Explanations and Conclusions

1. Meaning Separation

Meaning separation was measured by comparing patterns of ratings on semantic scales a subject gave to translated equivalents. It should be minimal for students who acquire the second language through the translation method. However, students with unfavorable attitudes towards the other language group would maintain a greater differences in the meanings of equivalent concepts. This was proved by the obtained correlation. Also students who did not want to learn the language maintained a large meaning separation. Since the terms used were personal value to each individual - such as "me" and "friend", it might be that those students with negative attitudes toward the other language group would try to keep separate in the two languages the meanings of concepts which are of direct personal value to them. Further research would be needed with less personal concepts. The indications here suggest that the meaning of a word has two components: a general attitude towards the language group and the meaning of the concept.

2. Sex and accent

Boys were more fluent in French and had better French-Canadian accents than girls. This could be due to the boys having more opportunity to have dealings with members of the other language group through sports events and the like.



3. Accent, Aptitude

There was no relation between accent and aptitude. Accent seems to depend mostly on an integrative motive in language learning. Moreover, accent, number of associations in French, automaticity and meaning separation were not correlated with aptitude, but quite significantly with the integrative motive. These appear to reflect an actual usage of the language in bilingual situations, or in other words, depend on interaction with members of the other linguistic community.

4. Anomie, discipline and integrative attitude

The relation of anomie to home discipline suggests that a general dissatisfaction with one's position in his own cultural group is a result of the punishment received as a child. This in turn would be the background for the positive attitude towards the other group. Also, anomie was slightly related to the integrative orientation which would add further support to the theory that one reason for having an integrative orientation is dissatisfaction with one's own community.

5. Aptitude, achievement division

In examining intercorrelations between all variables, language skills again fell into two factors, one dependent on aptitude and school achievement, the other on integrative-

motivational orientation. These two factors were also positively correlated with each other. This would suggest some interdependence between French achievement and the integrative motivation.

6. Perception of self

An integrative motivation was related to perception of the other language group as being comparatively similar to the self. And the opposite was true. A negative attitude towards the French-Canadian community was associated with a tendency to perceive this group as different from the self.

7. Effect of unfavorable attitude

There was a low negative correlation between an unfavorable attitude towards the French community and French achievement. This could mean that only when his attitude towards the other group is extremely unfavorable does it affect a student's ability to acquire at least those second language skills which can be taught in school. In such case, however, the student would have to have considerable aptitude and motivation (other than integrative) to learn the language.

8. Orientation and Attitude

Integratively oriented students tended to like their French-Canadian acquaintances more than those who were instrumentally oriented.

9. Parent's orientation

A student's orientation seemed to be related to that of his parents. Integratively-oriented students tended to have at least one integratively oriented parent, instrumentally oriented students, has a parent with similar orientation. Integratively oriented students tended to come from homes where the attitude was pro-French. The homes of the instrumentally oriented students were either neutral or negative in their attitude to French Canadians. Yet, a student's orientation was not linked with his opportunity of using the second language at home, and neither was the mother's nor the father's proficiency in French related to orientation.

Anisfeld and Lambert

Social and Psychological Variables
in Learning Hebrew

Journal of Abnormal and Social
Psychology,
1961, Vol. 63, No. 3, 524-529.

Object

To find the correlations between achievement in Hebrew learning, attitude towards the Jewish community, and orientation towards either the Jewish or English-Canadian culture.

Subjects

The subjects were Hebrew-school students from two districts of Montreal. Westmount and Outremont. In Outremont, the parents are relative newcomers to North America. In Westmount, most parents are second generation North Americans.

Results

With the Outremont students attitudes to the Jewish community correlated with achievement.

With the Westmount students orientation, (which measures the desire to integrate in the Jewish culture), correlated with achievement.

For both groups of students, grades in Hebrew correlated with results of language aptitude and intelligence tests.

Conclusion

This study proved that both ability for languages and attitude towards the second language group are important for success in learning a second language. However, while intelligence and language ability are stable predictors of success, the effect of attitudes can vary in different communities. The children from the Outremont district seem quite sure of their position in the Jewish community, and their attitudes towards this position influenced their achievement in Hebrew.

The Westmount children, who have well-to-do parents that are quite secure in their position as North Americans, seem to have a problem of cultural identity. The extent to which they wanted to belong to the Jewish community influenced their learning Hebrew.

Thus, in analyzing the importance of attitudes for second language learning, one must take into account the socio-psychological characteristics of the community.

Gardner and Lambert

Language Aptitude, Intelligence and
Second Language Achievement.

Journal of Educational Psychology
1965, Vol. 56, No. 4, pp. 191-199.

Object

1) To find the correlation between intelligence,
language aptitude, and achievement.

2) To determine which second language skills are
associated with specific language abilities.

Subject and Experiment

Monolingual high school students of Louisiana were
given tests measuring language aptitude, mental ability in
French. Grades in French and general academic standing of
each student were also obtained. Analyses of all these
variables yielded seven independent factors.

Results

Factor I

Language aptitude

Reasoning ability

Phonetic discrimination

Reading

Grammar

Linguistic reasoning
ability

Reasoning skills
important to language
aptitude

Factor 2

French achievement

Vocabulary

French vocabulary knowledge

Phonetic script test

According to Carroll the Phonetic script test measures the ability to code auditory phonetic material in such a way that this material can be recognized, identified and remembered over somewhat longer than a few seconds. Apparently complete vocabulary knowledge (as distinct from simple knowledge of English equivalents of foreign words) - is not so dependent upon a passive rote-learning ability as much as on higher cognitive skill in which the individual actively seeks to impose a meaningful code on the material.

Factor 3

French grades

Academic Average

School French achievement

Mid-term French Grades

The teacher's evaluation of a student's achievement in French seems related to the student's general academic average. Also, in this school system at least, French grades depend on knowledge of French grammar; other variables are only minimally involved.

Factor 4

Reading aloud fluently

Accurate pronunciation Oral French reading skill

European French accent

Correlation with ability in number learning test

The number learning test measures both memory skills and auditory alertness. This correlation suggests that in order to orally reproduce foreign language material, students must not only be alert to phonetic differences but must also be able to retain them for subsequent use. It is significant that rote memory was not an important variable in this factor.

Factor 5

Comprehension

Accurate speech Relative French
Sophistication

Reading

Correlates with achievement in

Spelling clues test

The Spelling clues correlation suggests that, with a minimum of training as these students have had, comprehension, fluent speech and reading would depend on an ability to infer meaning quickly from relatively complex material.

Factor 6

Intelligence

did not correlate with
other factorsFactor 7

Verbal knowledge

It seems that despite significant correlations between indices of intelligence and measures of linguistic aptitude and achievement in French, one cannot postulate a clear relation between the three factors. Measures of intelligence here were relatively independent of both language aptitude and second language achievement.

Lambert, Gardner, Olton and Tunstall

A Study of the Roles of
Attitudes and Motivation in
Second Language Learning

1962, McGill University

Introduction

Previous studies in Quebec have shown how important attitude is in learning a second language. This study examines the relation of attitude to 2nd language achievement in several American regions. Two were bicultural and the third mainly unicultural - more of a "typical" urban American city. The bicultural settings permitted an examination of attitudes working two ways: the attitude of American students towards the linguistic minority groups in their immediate environment, and the attitude of members of the minority towards the general American culture about them.

Experiment

Rotational factor analysis was used to find the interrelations between intellectual and linguistic aptitudes (measured by IQ and Modern language aptitude respectively tests) specific French out-group attitudes, generalized other-group aptitudes, motivation and various measures of French achievements.

Subjects

The subjects were students in their first, second and third year of high school.

Results

Noticeable correlations varied with each district; the emphasis for one part of the study might be on the relation of aptitude to language skills, while for another it would be how cultural adjustment affects language learning. It was thus impossible to summarize this study in a brief set of contrasts. Instead, lists of correlated and uncorrelated variables for each sample of students will be given and followed by explanation.

Louisiana American

A

				See paragraph
1.	High Intelligence Lang. aptitude	)* ) )	grammar reading vocabulary	I school grades
2.	High motivation	)	vocabulary	Parental encourage- ment more for instru- mental goals.
3.	Ethnocentrism prejudice	) ) ) )	poor achievement in school work but some skill in free speech	II
4.	Fav. evaluat. of Franco-Americ. speakers	) ) )	girls	good in comprehension vocabulary feeling adequate in Fr.
5.	Intellectual school grades	|	X pronunciation	III
6.	Motivation	|	X integrative orientation	

*) correlated with
)

X uncorrelated with

Louisiana American

I - Intelligence, aptitude & accent

Intellectual capacity was not important to accurate French¹ pronunciation, linking, stress rythm and accent. The Oral skills are not emphasized in school, which contrasts with the Montreal educational system. Those aspects of language that are emphasized in school - grammar, vocabulary and reading - correlated strongly with intelligence and aptitude.

The effect of an integrative orientation on language learning would seem to vary with the socio-cultural characteristics of the community. The Louisiana community appears to be bicultural but not bilingual and possibly integration into the French community can take place without learning the French language².

II - Prejudice & achievement

However, the ethnocentric or prejudiced attitude corresponded clearly with poor achievement. Students with such an attitude were likely to do badly in school French and comprehension, independently of their intellectual capacity or even motivation. But they showed some skill in free speech.

1. Parisian French is used as the standard.

2. See R. Houle - Le fait français en Louisianne - .

820-29 - Cs - Misc - 7 - Nov '65 - Working Paper.

III - Evaluation & achievement

Girls had a more favorable evaluation of Franco-American speakers, were better in comprehension and vocabulary, and felt adequate in French. Which goes to show some second language skills in which girls seem to be superior. It also suggests that understanding of other languages might reduce the tendency to react unfavorably to people speaking that language, or conversely, that a favorable outlook towards foreign people can contribute to various language skills.

Maine American

French grades	) intelligence	) reading	) democratic
	) aptitude	) vocabulary	) orientation

Motivation	) girls	) ) good grades	| intellectual
sensitivity	)	)	| X aptitude

No. of French	) comprehension
friends)

Feeling of doing	) oral ability
well in French)

Instrumental	) parents with many
orientation	) French friends

Ethnocentrism	| <u>poor</u> grades
	| Xnegative attit. to
	| Fr. Am. or Eur. Fr.

Maine American

I - Grades in French corresponded with the marks obtained in tests of intelligence, language aptitude, reading and vocabulary. Students who didn't have authoritarian tendencies tended to get good grades. Girls with a strong motivation for high grades in French, and a sensitivity for the feelings of others, did well in course work, quite independently of their intellectual aptitude. Their motivation seemed to depend in a large measure on identification with the teacher of French. In Louisiana it depended more on favorable parental attitude.

II - Comprehension & Friends

 Comprehension, which involves an aptitude for verbal symbols, correlated with the number of French friends. It may be that having French friends helps in comprehension, or vice versa - those who have this symbolic aptitude are attracted to French-speaking people.

III - Oral skill, grades, self-evaluation

 There was little association between oral abilities in French and school grades. It is interesting to note, however, that students felt they were doing well in French when they had good oral ability. They did not necessarily

consider themselves competent when they obtained high grades. For the teacher, on the other hand, the good student is one who is highly motivated, skilled in vocabulary and grammar and non-authoritarian in ideological outlook. The fact that students and teachers disagree as to what is important in learning a language might have important implications.

IV - Orientation, parental background

Students with an instrumental orientation tended to have parents with many French friends. This suggests that early familial experience with the French community alerts the children to the practical value of knowing French. They tended to do especially well in French linking and rythm.

Connecticut American

- I - Hartford, Connecticut was chosen to provide a comparison for the other two American settings. It does not have a large French subcommunity and thus attitudes would not generally be developed through direct contact with French-speaking people. Another point of comparison is that Hartford high schools strongly emphasized the use of modern language training methods especially language laboratories.
- II - To a large extent, the pattern of results followed those of Maine and Louisiana. Language aptitude subtests along with IQ were good predictors of French achievement. Tests of phonetic script and spelling clues predicted oral skill fairly well.
- III - Oral skill, intelligence, grade
- Oral skills were related to intellectual capacity and grades. This appears to be due to the emphasis placed on language laboratories. In the other two communities oral skills did not correlate to a great extent with grades or with IQ and language aptitude.

IV - Self-evaluation, motivation, attitude

A student's evaluation of his progress in French depended on his oral skill, his ability of listening comprehension and his knowledge of French vocabulary. A motivation to learn French, slightly more characteristic of girls, affected students' ratings of their own proficiency as well as actual school grades. A favorable attitude towards both European and American French people was more characteristic of girls than of boys.

V - Ethnocentrism, oral skill

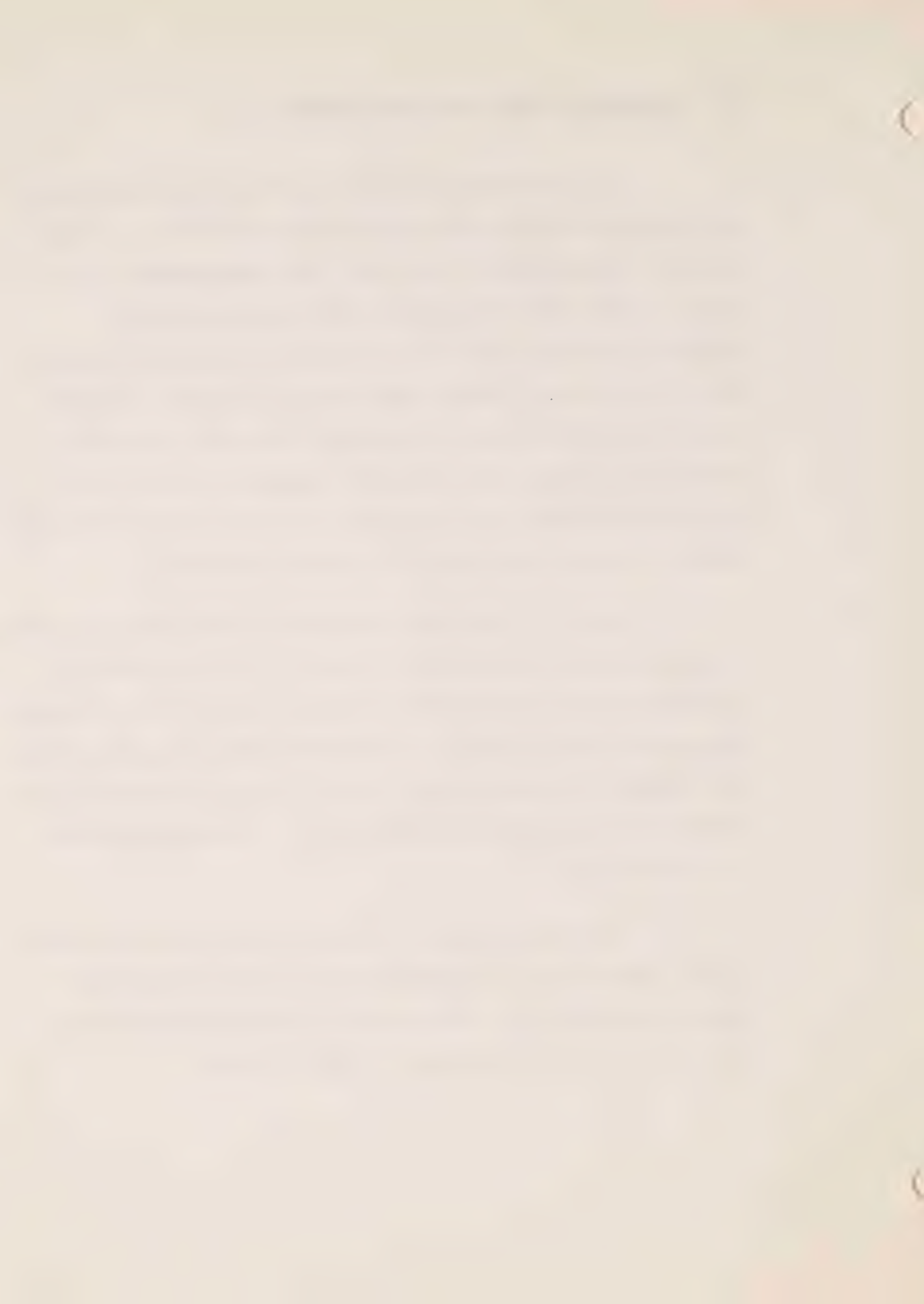
The authoritarian and ethnocentric student, - preferring American to French way of life, with negative attitudes to French people and not socially inquisitive - tended to be accurate in French free speech and proper linking. This is the second time that the relation between an authoritarian-type syndrome and skill in free speech was observed. Perhaps it means that a constricted personality trait aids in the development of certain oral skills.

II Summary of the American Students

In the Montreal studies aptitude and motivation were shown to be two equally important factors in second language achievement. They were also independent of each other: one could not predict from a knowledge of a student's aptitude what his attitudes or motivation might be and vice versa. While intellectual capacity is generally regarded as fixed by heredity, attitudes and motivation are amenable to remarkable change. Thus it is encouraging to find that those more changeable characteristics played so important a role in language learning.

With the American students the same two dimensions of aptitude and attitude were found to be independently associated with achievement in French. Specific attitudinal components however, take on different forms in each setting. The correlation method using factor analyses does not show whether attitudes are determinants of, or are determined by achievement.

Results of language aptitude tests were generally highly correlated with intelligence. Both of these measures correlated with achievement in reading vocabulary, and grammar in two settings but not in Maine.



In all three settings students who have strong motivation to learn French obtain good grades in the language. In each setting there is apparently a different foundation for this motivation. In Louisiana, it seems to derive from strong parental encouragement and personal satisfaction in the student's attempt to learn language. In Maine it is apparently fostered by the students' (especially girls) identification with French teachers and their sensitivity towards other people. In Connecticut it seems to come from students integrative orientation and their realization of the language's potential usefulness for them.

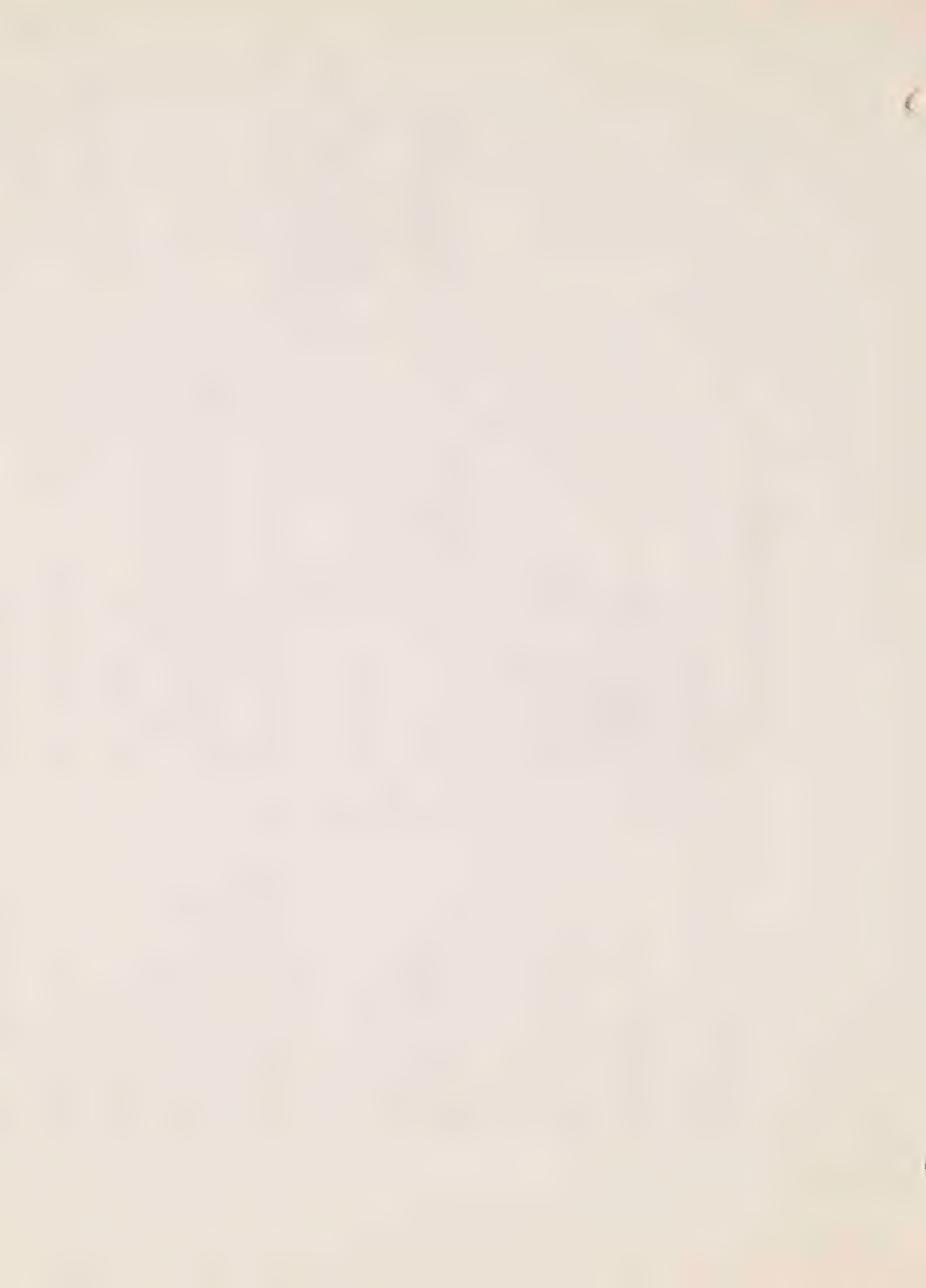
In Louisiana stereotyped negative feelings to Fr.-Americans. contribute to poor comprehension, and vocabulary. An integrative orientation gives the opposite effect. In Mainethe number of French friends determine students' comprehension. Those from families with many French friends and who are instrumentally oriented tended to develop good oral skills.

French grades tended to be independent of oral and often aural skills especially in Louisiana and Maine. The teacher's estimate of a student's progress is based on his skill in vocabulary and grammar which varies with the student's own estimate of language skill. He thinks the oral and comprehension aspects are the most important.



Louisiana Franco-American

Aptitude pref. for European Fr. culture	) ) )	aural achievement written)))
Motivation (integrat. esp.)	) ) )	feeling of being compet. in Fr. grammar)))
Fav. Evaluation of Eur. Fr. people	) ) )	good free speech (French))))
Negative " "	) ) )	poor oral French)))
Anomie tending to defend American culture	) ) )	boys)))
Little anomie	) ) )	girls)))
Dominant Fr. vocabulary	) ) )	good oral-aural)))
" (too much dominance)	) ) )	emphasis on pro-american feelings dissociat with Fr. culture)))
Fav. to speech to aur. Fr. & Franco-Am.	) ) )	accurate French free speech)))
Authoritarian Ethnocentric	) ) )	far. to Fr. amer.)))
Strong desire for F. identity	) ) )	more use of French)))
Not. ethnocentric, fav. attit. to Franco-Am.	) ) )	good bilingualism)))
Oral skill	) ) )	aptitude or attitude)))



Louisiana Franco-American

The male Franco-American students seemed to have a pattern of anomie and a tendency to defend the American culture. When they had a distinctive F-A accent in French, they were skilled in oral French and felt they were poor in English. The girls had the reverse pattern. They showed little or no anomie, defended the European French culture, tended to have a distinctively European French accent (though their pronunciation might be inadequate) and felt they had a facility in English. They thought in English and preferred it to French. It seems that the type of French accent and the tendency to favor either English or French depends on identification with American or French culture as well as one's feelings of social dissatisfaction. Boys seemed to be more bothered than girls by their Franco-American background. This was reflected in their oral French linguistic habits and achievement in French. Girls tended to have an aural-written skill which seemed to depend on an integrative approach to French study as well as an aptitude for memorization.

Those students whose French vocabulary was dominant tended to do well in certain aspect of oral and aural French. However if the French dominance was difficult to overcome

they might emphasize their pro-American feelings and try to dissociate themselves from the French culture. Those with favorable reactions to speakers of European French as well as to Franco-Americans were accurate in standard French free speech.

Authoritarianism & language dominance

The Franco-American students with marked authoritarian and ethnocentric dispositions were favorable to Franco-Americans but dominant in the English language. This would indicate that the authoritarian member of a minority group will show signs of shifting his linguistic habits to those of the dominant culture. Other evidence indicates that the whole Franco-American community in Louisiana tends to emphasize the English language. A desire for French identity, on the other hand, leads to more use of French (though not necessarily to a general skill in French).

Successful bilingualism

It seems that only the student who is not ethnocentric and who has favorable attitude to his own cultural group is psychologically free to become fluent in both languages.

Maine Franco-American

Authoritarian pref. for
Franco-Am. culture

} poor comprehension
} feeling of being
} inadequate in Fr.
} and English

Orientation for Fr.
(Fr. thinking, speaking
identity seeking)

} dominant in French
} good comprehension
} felt adequate in Fr.

Social motivation
to learn French

} French domin. in vocabulary
} good phonetic skill in French
} bad English grammar

Pref. for American
culture

} dominance in Engl.
} anxiety about knowing
} Engl. well poor oral
} skill in Fr.

denial of value of knowing Fr.

(parents & student
limited in French)

= marginal position

girls

} oral & aural skill
}

} boys
} chauvinist
} for America
} written
} skill

different achievement probably due to different emphasis in
boys' and girls' schools.

Intellectually bright
&
non ethnocentric

Instrumentally motivated
&
parental encouragement

successful bilingualism

Maine Franco-American

The Maine Franco-American students demonstrated the important role attitude plays in first and second language skill. A student's attitude to his own linguistic-cultural group influenced his adoption or rejection of his own language. In other cases a conflict of allegiances affected his skill in both languages.

Pro-French orientation

Students solidly pro-French in orientation - that is, who thought in French, and preferred to speak in French tended to seek means of enhancing French identity. They were dominant in French, tended to do especially well in comprehension and felt adequate in the French language. A strong social motivation to learn French (social motivation defined as the drive to learn a language in order to remain part of a culture which is satisfying to the self) was linked with French dominance in vocabulary and good phonetic skill in French, but lack of ability in English grammar.

Pro-American orientation

Preference for American culture and denial of the value of knowing French was linked with dominance in English, but with an anxiety about knowing English well, and poor oral skills in French. The Franco-American student who had become dominant in English and who felt that both he

and his parents were limited in French was poor in oral skills, did not think French was a useful language to learn, preferred American to French culture and felt inadequate in English. He would be in a marginal position wanting to dissociate himself from the Franco-American culture but not having developed enough skills in English to feel secure in it.

Successful bilingualism

Two different types of students would seem to become successful bilinguals. One group was composed of the intellectually bright and non-ethnocentric students. The other included those who were instrumental in their approach to learning French and who received strong parental encouragement.

Summary of Maine and Louisiana Franco-American students

Maine and Louisiana apparently have two different types of French communities. Maine students have training in French from their first years of public school, in a parochial school system. The Louisiana students study French at high school level only, which makes a difference of nine years in training. This may be the reflection of a strong French community in Maine. Parents of Maine students are typically more skilled in French and give their children more encouragement. Maine students particularly enjoy being with other Franco-Americans. Their basic stereotype reaction to French-speaking people is more favorable than that of the Louisiana students. They speak more French among themselves and it seems that they are encouraged and offered more opportunities to do so.

The Louisiana student is poorer in French phonetic accuracy, linking, stress, rythm and nasalization. His accent in French is not distinctively Franco-American, that of his counterpart in Maine is. The free speech, reading fluency and comprehension of the Maine student is superior. However, this superiority in French is not linked with a deficiency in English. Maine students are in general more balanced in their bilingual skills.

These differences were not associated with authoritarianism, ethnocentrism, anomie, motivation to learn French, preference of French over English, general attitudes to Franco-Americans or to American culture. Apparently the important factor is that of being or not being part of a real French community. It seems that in Louisiana the French tradition is rapidly merging into the American culture. The Louisiana Franco-American is concerned about his identity as a French person. The Maine student seems to think of himself as a part of a living French community.



Comparison of Franco-American and American StudentsAural & Oral skill

The Franco-American students were better in French comprehension, the Maine group being superior to the Louisiana group. In oral skill the Maine group was superior to the American students while the Louisiana group was no better than and sometimes inferior to the American students. The Louisiana Franco-Americans were no better than the English Americans in phonetic accuracy, linking, stress, reading fluency and accent and they were poorer on rhythm and accuracy of pronunciation. The Louisiana students were better only in French nasalization.

M.L.A.

The Franco-American students were poorer on all aspects of the Modern Language Aptitude Test. But this could mean that tests developed and standardized for monolingual subjects are inadequate for bilinguals. In free speech, all Franco-Americans were only as good or poorer than the Americans which may be due to their social reserve and their feelings of embarrassment of speaking in a Franco-American style.

Orientation, motivation

The Franco-Americans were more aware than the American students of the integrative and instrumental value of learning French, but they were only moderately motivated

to learn it; as though they felt they would like to learn French but it is useless to try too hard. In contrast the English students saw little value in knowing the language but were moderately motivated to learn it.

The Franco-Americans had higher scores on measures of authoritarianism and ethnocentrism. The authors suggest several different reasons for this. It may be attributable to the religious background of the Franco-Americans - Catholics are typically more ethnocentric and authoritarian, and most Franco-Americans are Catholic. It might also be symptomatic of the cultural background of the Franco-Americans where the father may still play an authoritarian role. Or it may reflect a cultural conflict in that Franco-Americans would feel marginal between two cultural groups. They were in fact found to be more anomic - more socially dissatisfied or discouraged with their place in society. Franco-Americans were more sympathetic to Franco-American culture than were the Americans, yet they preferred the American to European way of life more than the monocultural Americans. This pattern strongly suggests that Franco-Americans are confused in their allegiances to their two cultural heritages.

An analysis was carried out with the Louisiana English-speaking students to find the relation between a student's values (for example, whether achievement is his main goal or whether he is intellectually oriented) and his general achievement in school as well as his particular achievement in French.



Generally there was no clear cut relationship. Students who valued pleasure were no more or less likely to succeed in school than those who valued intellectual activities.

Those who valued ambition and success and negated the value of physical attractiveness tended to do well in all school work. However they did not develop skill in understanding spoken French. Their opposites, those who valued physical attractiveness did have aural skill. It could^{be} that because aural skills are not stressed in school one would have to make social contracts in order to develop ability in comprehension. The physically attractive student would be more at ease in making the social contacts than would the success oriented student. The contrast apparent here is that of the unattractive hard-working scholar who turns to his French lessons, versus the attractive socializer who is content to learn at least some French through personal contact. However further evidence is needed to support such an interpretation.

The motive to do well in French, when found together with a favorable attitude to French study leads to high French grades, grammar, reading and vocabulary skills but not necessarily to oral or aural skills. Students with a

high intellectual capacity, who want to achieve in life are likely to have high aspirations and expectations of achievement in school work. They don't think too much effort is needed to succeed and in fact they do well in all their course work. The students with the opposite pattern - who are intellectually limited - are less likely to set high goals for themselves in life or in school. They think school achievement is difficult and they are not willing or able to expend the effort needed for them to do well. The student who values success was found to do well in school, irrespectively of his effort, while the one who was only motivated toward success needed to work hard in order to do well, but when he did, he went beyond grade requirements.

Students who want to be successful and moral and artistic will not necessarily excel in school although they appear mature in their scholastic development and their preparation for a future occupation. The student who is interested in intellectual matters is generally optimistic about his ability for school work and for future life. This optimism is independent of intelligence and achievement. Also likely to be optimistic about French grades are those who place high value on being sociable; those with a strong moral orientation without social orientation; and those who are achievement oriented and do not value sociability or pleasure.



It seems that, irrespective of the amount of intellectual ability or drive to achievement, a student can do well in French when he is favorably motivated to learning that subject. But achievement in French is not a major goal for American students.



Bilingualism per se - Measures and Types

1. Effects of Bilingualism on Intelligence
2. Measurements of Bilingualism :—
Dominance/Balance
3. Types of Bilingualism :—
Compound/Coordinate

Peale and Lambert

The Relation of Bilingualism to
Intelligence

Psychological Monographs: General
and Applied 1962, Vol. 76, No. 27,
pp. 1-23

Object

See title.

Subjects

Monolingual and bilingual 10-year old children from six Montreal French schools. They completed verbal and non-verbal intelligence tests as well as measures of attitudes to English and French communities.

Results

1. Contrary to most previous findings, the bilingual children scored higher on all intelligence tests.
2. Intellectual structures for bilinguals and monolinguals differed, bilinguals having a more diversified set of mental abilities.
3. The bilinguals had a more favorable attitude to the English Canadians, which seemed to reflect the attitude they found at home.

Discussion

MacNamara¹ criticized this experiment saying that the monolinguals were placed at a disadvantage. Pre-experiment

1. Bilingualism and primary education. A survey of Irish experience in press.

tests which were used to sort out those bilinguals who were really proficient in both languages, would have left only children of higher intelligence. The bilinguals therefore, would have had a higher average intelligence to start with.

The authors admit that those who suffered from a language handicap as a result of bilingualism, as well as pseudo-bilinguals, who did not really know the second language well, would have been excluded from the study. They tried to select only those children who had an equal vocabulary and an equal facility in both languages. But the selective tests were themselves not particularly difficult, and could have been passed by bilinguals of all levels of intelligence.

It is still hard to tell, however, whether it is the intelligent children who become bilingual or whether bilingualism itself has a favorable effect on non-verbal intelligence. The more intelligent children may realize the value of knowing English and take advantage of any opportunity to learn it. Parents of higher intelligence may realize the assets of knowing English in Montreal. Not only would they be more likely to encourage bilingualism, they may be expected to have more intelligent children.

On the other hand, bilinguals also seem to have more symbolic flexibility, they scored higher on the non-verbal tests involving concept formation. It may be that bilingualism

helps the child to separate the sound of the word from the thing itself. Also, since the Montreal environment encourages a compound bilingualism, these children would have acquired experience in switching from one language to another, and thus would have acquired more mental flexibility. This would help them on tests requiring symbolic reorganization.

Lambert

Measurements of the Linguistic
Dominance of Bilinguals

Journal of Abnormal and Social
Psychology, 1955, Vol. 50
pp. 197-200

Introduction

One way of testing someone's fluency in a given language would be to measure the speed with which he responds to commands given in that language. A bilingual who is dominant, (more fluent) in one language would have a greater speed of response in that language. The same speed of response to commands in either language would indicate bilingual balance or equal fluency in both languages.

Subjects

Three groups of subjects were chosen for their varying degrees of experience with the French language. Two were American college students who were specializing in French either at the undergraduate or graduate level. The third group was composed of native speakers of French.

Experiment

Subjects were told to place their fingers on eight different coloured keys as on a typewriter. They were then directed either in English or in French to press down on one of the keys e.g. for the red key on the left hand side - red, left or gauche, rouge. Speed of response was measured by a stopwatch.

Results

In general, the difference between speeds of reaction in two languages decreased as experience with the second language increased. There were some exceptions. Two American graduate students who would presumably be more fluent in English, measured dominant in French. Interviews with these subjects and their friends revealed that one was culturally malcontent and very much attracted to France and the French language, while the other subject was a French high school teacher who had had to do most of her work and thinking in French.

Experiment 2

Subjects were asked to give associations to sixteen commonly used words.

Those who were more dominant in French, as measured by the speed of response experiment, also gave more association in French.

Conclusion

Timing speed of response to commands is one method of measuring fluency in a language, and determining whether a bilingual is dominant or balanced. Speed of response corresponds with the number of associations a subject can give to stimulus words.

Lambert and Moore

Word Association Responses:
Comparisons of American and
French Monolinguals with Canadian
Monolinguals and Bilinguals

Journal of Personality and Social
Psychology, 1966, in press

Introduction

The associations evoked by a word are essential to its meaning. Fidelity of communication across (as well as within) language communities is limited by differing associations evoked by words (translated equivalents) which denote the same concept and logically have the same meaning.

Object of experiment

Comparing the associational responses of:

- 1) English Canadians and Americans
- 2) French Canadians, Americans, English Canadians and French students from France
- 3) Quebec bilingual and monolingual groups.

Three features of associational responses were examined: Stereotypy (diversity of responses within the group), degree of equivalence of specific responses to the same stimulus or its translated equivalent, and the use of superordinates - generalizations (e.g. association for table - furniture.)

Results

English Canadians were similar to Americans with regard to all three features.

French Canadians showed the same degree of response diversity as did the French. This was greater than for all the other groups; both French groups showed little stereotypy. This is perhaps the result of both groups following a "classical" program of instruction where stress is placed on development of ideas, rather than on short answer type questioning. There may also be a general cultural contrast between French people and American. However, with regard to content of responses and use of superordinates, the French Canadians were as different from the European French as were the English Canadians and the Americans.

The associational responses of bilinguals changed as they changed languages, becoming more similar to the English Canadians when speaking English, and more similar to French Canadians when changing to French. The relationship of bilinguals to the two monolingual groups are relatively stronger than that of the two monolingual groups to each other. Could certain types of bilinguals, therefore, act as a liaison between two cultural groups?

Lambert

Developmental Aspects of Second-Language Acquisition: 1. Association Fluency, Stimulus Provocativeness and Word-Order Influence.

Journal of Social Psychology, 1956, 43, pp. 83-89

Object

See title.

Experiment

Three groups of subjects at different stages of fluency in French were asked to give continuous associations to French and English words in either language.

The responses of the three groups were compared for:

1. number of associations they gave to French words.
2. the language they chose to give associational responses (when they were given a choice of responding in either English or French)
3. their ranking pattern of provocativeness of stimulus words. (i.e. the amount of associations they gave to each stimulus word. It is assumed that the same concept can have a different amount of associational response for different language groups. The word "reason" might have more associations thus, a higher provocativeness for French subjects. Each language group would have a characteristic ranking pattern of provocativeness for any group of words.)

Subjects

The first two groups of subjects were undergraduate and graduate American students majoring in French. The third group was composed of native French speakers who spoke English as well.

Results

1. The undergraduate students could find fewer associations for French words. French concepts apparently had less meaning for them than for the graduate and French group, who did not differ too much from each other in this respect.

2. The undergraduate group gave more English responses, the graduate group gave about an equal amount of responses in both languages while the French group gave more responses (though not at a significant level) in French. Thus as bilinguals progress in experience with a particular language, they give more associational responses in that language, when given a choice of languages of use.

3. The graduate students were more like the French in their patterns of provocativeness of stimulus words. Thus, as bilinguals progress in experience with a particular language, they approach the pattern of provocativeness of stimulus words as shown by native users of that language.

Lambert

Developmental Aspects of Second Language Acquisition: II. Associational Stereotypy, associational form, vocabulary commonness and pronunciation and
III. A description of developmental changes.

Journal of Social Psychology 1956,
Vol. 43, pp. 99-104

Object

To develop measures of bilingualism.

Subjects of experiment

Same as in Study I. - undergraduate and graduate American students majoring in French and native French speakers.

Experiment

Continuing study 1, the 3 groups subjects were asked to give continuous associations to French or English stimulus words. The undergraduate, graduate groups were compared for:
stereotypy of response - repetition the same response within the group.

associational form - types of associations given -
e.g. definitions, contrasts, personal associations
associational content - use of common or less frequently used vocabulary.

Results

The results appeared to disprove the hypotheses the authors made about second language acquisition - there was no great difference in the form, content or stereotypy of response of

the undergraduate and graduate French students. The contrast was rather between these two groups and the native French speakers. However, if the results of this study are combined with those of Study I an interesting trend can be seen.

<u>Vocabulary cluster</u>	<u>U G F</u>		
Facility with abstractions	U		G F
French word-frequency	U		G F
Choice situation	U		G F
word fluency in French	U		G F

<u>Cultural difference cluster</u>			
Habitual word order	U G		F
rankings of provocativeness	U G		F
stereotypy of response	U G		F
associational form	U G		F
associational content	U G		F
pronunciation	U G		F

U - undergraduate American

G - graduate American

F - native French

The graduate students tended to be like the native French speakers in the vocabulary aspects of French. In those aspects of the language which involved cultural characteristics, the graduate students did not differ greatly from the undergraduates.

Interpretations

1. The vocabulary barrier would be the easiest to overcome in learning a second language. The hardest aspect of language learning would be the assimilation of aspects of the different culture which influences the language behaviour.

2. Tests measuring progress in vocabulary would differentiate the progress of individuals who have recently acquired a second language. These tests might not be as sensitive with more advanced students since all of them might have attained a similar level in vocabulary. The advanced students could differ importantly however, on cultural measures.

Therefore comprehensive measures of bilinguality would involve tests taken from both the vocabulary and cultural clusters.

3. The incorporation of the cultural aspects of the linguistic community seems to be the most advanced stage of skill for both the child with his first language, and the adult with his second. The process of socialization of the child (or acculturation) takes place largely in a linguistic medium. The language behaviour of the child is continuously modified by the influence of socialization, long after he has developed the vocabulary needed for expression. The same problem seems to face the adult with his second language i.e. the process of linguistic enculturation takes the most time.

Lamber, Havelka and Gardner

Linguistic Manifestations of
Bilingualism.

The American Journal of Psychology
March 1950, Vol. 72, No.1, 77-82

Object of experiment

To develop measures of bilingualism.

Subjects

English-French bilingual students at McGill University. They were classified as dominant (more fluent in one language) or balanced (equally fluent in both languages) according to their speed of response to French and English directions.

Experiment

The subjects were tested on their use and fluency of their two languages. The tests included: speed of word recognition, speed of word completion (e.g. giving as many completions as possible to letters "vi") facility in detecting words in a series of letters (e.g. "dancesondent") speed of reading, of translation, and responses made to bilingual words (e.g. table, silence). The results of these tests were compared with the degree of dominance or balance.

Results

Dominance in one language involved:

- a. quicker word recognition
- b. greater speed of reading
- c. tendency to read bilingual words in dominant language

- d. greater facility for word detection, and word completion

The results of the translation test were unexpected. Some bilinguals translated more easily into their less dominant language. It is suggested that these are the active language learners. In contrast to the passive learner, who may only look for equivalents of unknown symbols in his own language, the active learner would try to reduce the number of unknown symbols by translating into the less known language.

Conclusion

The closer an individual approaches bilingual balance, the more he will be able to perceive and read words in both languages with similar speeds, to associate in both languages with similar fluency, to make active use of his vocabularies in both languages, and be set to verbalize in both.

Lambert, Havelka and Crosby

The Influence of Language-Acquisition
Contexts on Bilingualism

The Journal of Abnormal and Social
Psychology, March 1958, Vol. 56,
No. 2, pp. 239-244

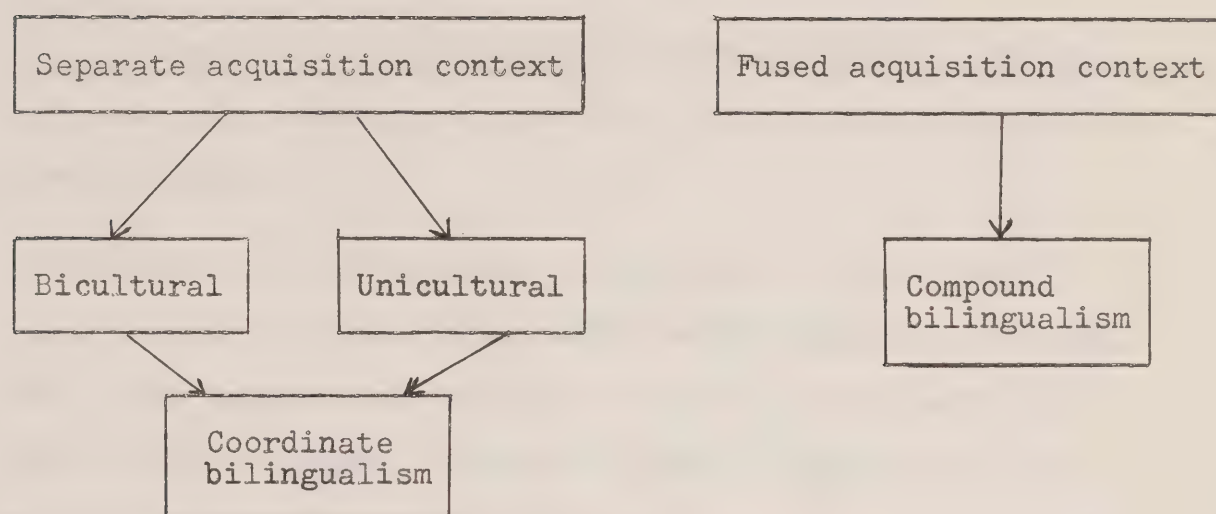
Introduction

Weinreich said that "a comprehensive and psychological theory of bilingualism should account for both effectively separated use of the two languages and for interference of the languages with one another." In learning a second language, there is the problem of keeping apart two different responses to the same stimulus. One way of minimizing interference between the two responses would be to make the secondary cues as distinctive as possible. This can be done by acquiring the two responses, or languages, in different contexts. The more separate the acquisition contexts of two languages, the less interference there would be between the two.

A bilingual would have had separate acquisition contexts when the associations and the environmental event of a symbol such as church have always taken place in a different setting from that of église. Ervin and Osgood suggested that bilinguals would acquire compound systems through fused learning contexts (vocabulary training in school, same people using two languages interchangeably) and coordinate systems through experiences in different linguistic communities. Coordinate bilinguals

would develop separate reactions to each alternative symbol.

i.e.



Purpose

To test the Ervin and Osgood hypothesis.

Subjects

Bilinguals were classified as having learned their two languages in either separated or fused contexts. "Separate" bilinguals were further classified as bicultural (having learned the two languages in geographically different cultures), or unicultural.

Experiment

The subjects were asked to rate meanings of words along scales with seven-point ranges between contradictory adjectives e.g. - house

fast - | - | - | - | - | - slow

pleasant - | - | - | - | - | - unpleasant

Results

As predicted the separate bilinguals showed a greater difference in meanings of translated equivalents than did the fused bilinguals.

However, the difference between the two groups was mainly due to the bicultural separate bilinguals. It seems then, that separated acquisition contexts in the same geographic culture might not make too much difference in the meanings of translated equivalents.

Experiment

Subjects were given a list of English words to memorize. Along with this list they had to learn, at one time, a list of nonsense syllables, and at another time a list of French words which were the translated equivalents of the previous English words. Since the translation would be more like an extension of the original English word list for the fused bilinguals, it would help them to remember the first lists. The separate bilinguals would find the translation as much help as the list of nonsense syllables. This was confirmed. Moreover, in this case there was no difference in the degree of associative independence between bilinguals with bicultural and those with unicultural experiences. The only contrast was between the separate and fused bilinguals.

There was no difference between the two groups in facility of switching from one language to the other. This was contrary to prediction. The authors suggest that it is perhaps because both types of bilinguals would have had equal though different experience in translating. The fused bilingual would have learned his second language in a context that encourages translation. The separate bilingual may often have to be the liaison between two linguistic communities and would learn to use concepts which have meaningful equivalents for members of both communities.

Lambert and Fillenbaum

A Pilot Study of Aphasia Among
Bilinguals Canad.

J. Psychology 1959, Vol. 12,
No. 1, 28-34

Object

A comparison was made between bilingual aphasia victims of Montreal and Europe. The results seem support the theory of compound and coordinate bilingualism. Montreal probably would encourage the development of coumpound bilingualism since essentially the same context for language learning is used for all languages acquired. The aphasia victims from Montreal suffered a more generalized disorder affecting both languages. The European bilinguals who typically learned their second language in a separated context from the first, and would thus be liable to have a coordinate bilingualism, showed a more specific language disorder.

Lambert, Gardner, Barik and Tunstall

Attitudinal and Cognitive Aspects of
Intensive Study of a Second Language

Journal of Abnormal & Social
Psychology 1963, Vol. 66, No. 4,
pp. 358-368

Object of the Experiment

Students attending a six-week French summer school at McGill were examined for their attitudes towards French people and culture, their orientation towards learning French and their feelings of anomie¹ at the start and at the end of the course.

Subjects

Elementary students were compared to those at a more advanced level. (The general level of all the courses however, was advanced; the students in the elementary section were required to have a working knowledge of French, 2 years of French in high school and one semester in college.) The great majority of students were from the U.S.

Results

1) Elementary students who had a favorable attitude towards the French community were more likely to do well in the courses. For the advanced students, however, there was no similar correlation between attitude and achievement.

1. Durkheim defines the term anomie as the feeling of social uncertainty or dissatisfaction which can be the experience of the socially unattached person, the bilingual and even the serious student of a second language.

2) Elementary and advanced students who maintained semantic distinctiveness between English and French translated equivalents tended to get lower grades.

3) During the course of study there was a rapprochement of meaning systems of the two languages for all students. That is, translated equivalents became similar in meaning and associations. This was especially true for the elementary group. The advanced group did not experience as much meaning change as a result of the intensive study course.

4) Although there was a correlation between attitude and achievement for the elementary group, there was none for the advanced students. For them, favorable attitudes correlated with anomie. This could mean that, as one progresses in the study of a second language, invidious comparisons are made between the first and second cultures.

Conclusion

Two important trends resulting from the intensive study course were:

- 1) increase in anomie
- 2) increase in similarity of meaning between translated equivalents.

The second trend suggests that students allowed English to interact with French which helped them in learning French. That is, they made use of interacting or compound linguistic systems.

The hypothesis is made that these students would develop generalized super-linguistic concepts which incorporate the semantic features of concepts in each language.

Yeni-Komshian

Some Training Procedures Applicable
to Teaching the Sound Systems
and Vocabularies of Foreign Languages

1965, Phd. Thesis, McGill University

Purpose

To evaluate some training procedures for second language teaching. The first study examines the effectiveness of training in developing auditory skills. The second deals with alternative procedures for teaching vocabulary.

- I. Can auditory abilities for second language learning be improved by training?

Experiment I

Second and third year high school English-speaking students of Montreal were given aptitudes tests¹ designed to measure auditory ability. The experimental groups received 2 one-hour training sessions (mainly practice exercises) on sound discrimination, identification and sound-symbol association. All groups were then given a second run of aptitude tests. The variables studied were 1) trained versus untrained, 2) boys versus girls, 3) immediate or delayed confirmation (feedback) of results during the training exercises.

1. These are part of the Modern Language Aptitude Tests, 1959 Carroll and Sapon.

Results

The trained groups that received an immediate feedback had an increase in phonetic script ability, in pitch and sound symbol discrimination. Those with delayed feedback had almost the same results as those who received no training.

The girls had higher initial scores on the aptitude test. Perhaps because of this they showed less marked improvement after training than did the boys. Also the girls might have been less motivated because they were not paid as were the boys, or else because the time interval between initial and final tests was longer for the girls, they may have been at a disadvantage. However, girls were better on all tests of auditory discrimination and did especially well on the spelling clues test.

Conclusion

If subjects received immediate confirmation of results during training exercises, training in auditory skills improves achievement on auditory aptitude tests.

II. Is it more efficient to learn two vocabularies consecutively or concurrently?

Experiment 2

Subjects were asked to learn two sets of nonsense syllables symbolizing one set of nonsense forms. For one set, the syllables were placed in a box outlined in red, referred

as "R" vocabulary, or the other set the box was blue, referred as "B" vocabulary. The two vocabularies were presented in concurrent or consecutive orders. Artificial vocabularies and nonsense forms were used so that subjects would not have prior associations which might intervene in learning. The subjects were told to memorize until they had mastered both vocabularies. Then they were given immediate retention test, and after an interval of two to three weeks, unannounced delayed retention tests. Although there were other variables involved, the main comparison was that of consecutive versus concurrent presentation of contrasting vocabularies. (There were also variations in each). The results were compared in terms of rate of learning and amount of immediate and delayed retention.

Results

The concurrent order RBBR was the most effective. Subjects took longer in learning the first list, probably due to interference between contrasting items. However, the rate of learning was considerably improved for the second list, and the quality of retention was superior for both lists.

Conclusion

The RBBR presentation of a vocabulary is characterized by contrasting items organized in sequences of glosses. Here the subjects were engaged in discriminating learning as well as forming symbol-referent associations. They had to learn to respond to those features which are critical for keeping

each referrent unique. Thus it seems that presenting vocabularies in groups of highly similar items and emphasizing the distinctions between them is more efficient than presenting similar items separated by dissimilar ones. However, it is quite possible that this sequence is best suited for vocabulary and not for other aspects of language instruction.

Language per se

Conditioning

The Effect of Repetition on
Meaning

Learning Nonsense Syllables by
direct or indirect translation
method

Barik and Lambert

Conditioning of Complex Verbal
Sequences

Canadian Journal of Psychology
1960, Vol. 14, pp. 87-95

Object

Researchers have shown that simple and discreet verbal responses can be conditioned. This study was an attempt to condition a complex verbal response.

Experiment

The subjects were asked to complete a sentence by adding a subordinate clause: e.g. This is the mountain that... For one group, after each clause that referred back to the first subject of the sentence - called subject response e.g.: This is the mountain that is covered with snow, the experimenter said "good". For another group the response of "good" came after each non-subject response (This is the mountain that I climbed). The control group received no response. The subjects were not told the relation between their behaviour and that of the experimenter. When questioned later, only eight of the 45 showed any awareness of what it was.

Results

There was a significant increase in the number of non-subject responses for the non-subject conditioned group. There was no change for the subject group.

Conclusion

The authors suggest that the subject response has a greater number of probable alternatives and is therefore harder to elicit by conditioning. The non-subject response is more easily conceptualized and thus would be more consistently affected by the experimenters' reinforcements.

Jakobovits and Lambert

Verbal Satiation and Changes in
the Intensity of Meaning

Journal of Experimental Psychology
December, 1960, Vol. 60, No. 6,
376-383.

Introduction

The lapse or radical change of meaning of a word, as a result of its continued repetition, is known as verbal satiation.

Experiment

College students were asked to repeat a certain word continuously. They then rated it along scales of semantic differential (seven point range between opposite adjectives). This rating was compared with one made before satiation.

Results

When the word was satiated, ratings moved to the center point of the scale. That is, they became less meaningful.

Experiment 2

A second experiment showed that the satiation effect appears to depend on consistent reactivation of a cognitive activity. When syllables were changed around so that the same sounds were repeated but in a meaningless form, (i.e. nu-ka, instead of canoe) there was no significant amount of semantic change in the meaningful form (i.e. canoe)

Conclusion

There is a suggestion that the satiation effect is not generalized but stems from change in the symbol which is continuously repeated.

Kanungo and Lambert

Semantic Satiation and Meaningfulness

American Journal of Psychology 1963,
September, Vol. 76, pp. 421-428

Object

Since the meaning of a word is linked with the number of associations it evokes, this study tried to explore the effect of repetition on word association.

Experiment

Sixteen frequently used nouns were presented in four sets. All the sets were equal in their average meaning value, which was defined as the mean number of relevant association to all words given within a 60-second period by all subjects. The number of associations to a set was obtained with the first test. Words were satiated both by visual fixation (subject asked to look fixedly at the word printed on a card) and continuous verbal repetition. After 24 hours subjects were given their second test.

Experimental Condition I:

The meaning value for the same set was obtained from the same subjects gone before and after satiation. In the second experimental condition the meaning values of the same sets were obtained from different subjects before and after satiation treatment.

For the first experimental condition there was no significant difference between the mean number of irrelevant responses on the first and second test, but a significant increase in the number of relevant responses on the second test. For the second experimental condition there was a drop in the number of irrelevant associations.

This result was explained as follows: In the first experimental condition there may have been a facilitation due to memory and the blocking effect of satiation did not show up. In the second condition, the relevant responses were blocked, the subjects then may have tried to fill in as many spaces as possible by turning to a repertory of irrelevant responses. The subjects may in fact have believed that the irrelevant responses were relevant, which would mean that the meanings had been modified.

It is suggested that satiation changes the meaning of a word by blocking relevant associations and modifying irrelevant associations.

Jakobovits and Lambert

Semantic Satiation in an Addition Task

Canadian Journal Psychology 1960,
Vol. 16, No. 2, 112-119

Object

Semantic satiation was studied with regard to mathematical symbols.

Experiment

It was predicted that verbal repetition of a number, prior to an addition problem in which that number is one of the additives, would result in a decrease in the efficiency of its solution.

Results

The prediction was confirmed but two opposite effects were noted: an improvement effect due to practice, and a decrease in efficiency due to an accumulation of the satiation effect.

Conclusion

The concept of satiation would be important for learning theory if it could be determined by further studies in what conditions repetition is productive, as in the acquisition of a response, and in what conditions disruptive, as in semantic satiation.

Jakobovits and Lambert

Stimulus-Characteristics as
Determinants of Semantic Changes
with Repeated Presentation

The American Journal of Psychology
March, 1963, Vol. 77, pp. 84-92

Object

Previously semantic satiation was demonstrated with words usually naming objects. In this study the effect of satiation was studied with:

- 1) words
- 2) the objects the words named
- 3) clear photographs
- 4) underexposed photographs of the objects

Experiment

The four types of stimulus materials were shown to four different groups. All groups were asked to rate the stimuli on semantic scales before and after repeated presentation. The number of presentations was constant for all stimulus material, but the type of material changed from specific to general. Objects, containing the largest number of visual characteristic, would be the most concrete, therefore the most specific type of material. Words which only label objects but do not specify as to detail (size, colour) would be the most general.

Results

Repeated presentation led to semantic satiation (decrease in meaning) for words, semantic generation (an increase in the intensity of meaning) for objects and intermediary effects for photographs.

Discussion

The strength and direction of semantic change, brought about by repeated presentation of stimulus, apparently depends on the total number of processes which can be elicited by that stimulus. When the stimulus is a word, only one process-utility is evoked. When the stimulus is an underexposed photograph, size and utility are shown. With a clear photograph, detail, size and utility are shown. With objects there is depth, colour, detail, size and utility. This, with the object itself (which elicits the greatest number of processes,) the strength of the mediational processes will increase with repeated presentation. With words, repeated elicitation of mediational processes will lead to semantic satiation.

Jakobovits and Lambert

Mediated Satiation in Verbal Transfer

Journal of Experimental Psychology
October 62, Vol. 63, No. 4, 346-351

Psychologists have long realized that mediators are important in associative processes. Previous experiments have established that designs which used mediators facilitate paired-associate learning. In this study, the same designs were "tampered with" to inhibit rather than facilitate learning. The mediators were satiated. Assuming that mediation follows the sequence B-C-D the A-B list was learnt, C was satiated, then the A-D list was learnt. The results were as predicted, satiation of C, the mediator resulted in difficulty with learning the A-D list.

This type of study could be useful in eliminating undesirable verbal habits and perhaps even non-verbal ones. It could also provide a tool for experimental manipulation of implicit verbalizations or meanings in studies of thinking and problem solving.

Kanungo and Lambert

Effects of Variations in Amount
of Verbal Repetition on Meaning
and Paired-Associate Learning.

Journal of Verbal Learning and
Verbal Behaviour, 1964, Volume 3,
358-361

Object

To investigate the effects of varying amounts of continuous repetition of a word on both the meaning change and rate of learning.

Experiment

- 1) Subjects rated the meanings of words on three semantic scales - good-bad, active-passive, strong-weak. They were then asked to repeat the words aloud for a period of either 5, 15 or 25 seconds. Immediately after repetitions, subjects rated the meaning of words again.
- 2) All subjects were asked to learn a paired associate list. For the experimental group, the response words of the list to be learned were satiated with the 5-15-25 second repetition treatment. For the control group, words not in the paired associated list were satiated.

Result

- 1) There was no reliable difference in the results from the 5-15 or 25 second repetition conditions.

2) Paired associate lists were learned more slowly when the response words were satiated, than when control words (those not included in the paired associate list) were satiated.

Conclusion

1) The amount of repetition does not produce any significant difference in the meaning of a word. Apparently semantic satiation occurs after a critical amount of verbal repetition, but any increase in repetition after the critical amount does not change its effect on either meaning or learning.

2) There were similar results for both meaning and learning. This suggests that semantic satiation plays an important role in verbal learning, at least for response members of paired-associate lists.

Kanungo and Lambert

Paired-Associate Learning as a
Function of Stimulus and Response
Satiation

Brit. J. Psychology 1963, Vol. 54,
No. 2, 135-144

Introduction

Does satiation treatment equally affect stimulus and response words of a paired associated (stimulus-response) list? According to other experiments, a decrease in the meaningfulness of response words produces greater inefficiency in learning paired associate lists than does a corresponding change in the meaningfulness of stimulus words.

Experiment

This study confirmed previous findings. Satiation treatment of response words caused a greater inefficiency of learning paired associate lists than did satiation of stimulus words.

However, there seem to be two process at work when a word is continuously repeated. There is the development of a habit to connect the repeated word with itself (word-word habit) as well as a decrease in the meaning of the word. Stimulus words were more affected by the word-word habit. The tendency to connect the stimulus with itself produced more change in the rate of subsequent learning than did the tendency to connect the response with itself.

Kanungo, Lambert and Mauer

Semantic Satiation and Paired-Associate
Learning

Journal of Experimental Psychology
1962, Vol. 64, No. 6, 600-607

Object

To find out whether a paired associate list will be harder to learn when the meanings of the stimulus or response words have been semantically satiated.

Experiment

Before learning a paired-associate list, an experimental group was given satiation treatment of response members. The control group was given the same treatment to words which were not response members.

Result

Satiation treatment decreased the connotative meanings of words, rated on semantic scales. The experimental group was slower in learning than the control group.

Experiment 2

Object

The effect of satiation of stimulus words on the recall of already learned paired associates.

Result

Satiation produced more retroactive interference. Satiation of both stimulus and response words resulted in a significant reduction in the intensity of their meanings.

Wimer and Lambert

The Differential Effects of Word and
Object Stimuli on the Learning of
Paired Associates

Journal of Experimental Psychology,
Vol. 57, No. 1, 1959, pp. 31-36

Introduction - Theories

1. Some language-learning theorists claim that foreign words are learned more efficiently when they are associated directly with environmental data than when learned with translated equivalents. That is, the direct method is more efficient than the indirect vocabulary learning method. If this is true, nonsense syllables, replacing foreign language words, should be learned faster when paired with objects than with the names of objects.
2. Difficulty of learning paired-associate lists decreases as the average meaningfulness in the list of stimuli increases.
3. The difficulty of learning a list of paired associates is proportional to the extent of intralist generalization. Generalization occurs when the stimuli are similar in some respect and a response originally paired with one stimulus occurs with a second stimulus.

Experiment

1. The first experiment tried to determine whether nonsense syllable responses are learned faster when paired with the

object, or with the word they are supposed to stand for. Object-word pairs were learned faster than word-word pairs.

Experiment 2

Subjects were asked to give written associations to stimuli which were either objects or words. The meaningfulness of each stimulus was defined as the average number of associations given by all subject to the stimulus, in a 60 second interval.

There was no significant difference in the amount of meaningfulness of words and objects.

Experiment 3

Examining the associations evoked by each stimulus, it was found that the intralist similarity of the word-syllable list - that is, the similarity within one list, was greater than the intra-list similarity of the object-syllable list. Since intralist similarity increases the difficulty of learning a list, it is suggested that the word-object pairs were learned more quickly because there is less similarity between objects than between words.

IV Morf

1. Piaget
2. Entrevue
3. Expériences



Encyclopedia Britannica
1965, Vol. 17, pp. 881B-
882

"The most distinctive feature of Piaget's contribution to experimental psychology is his developmental or genetic approach. His system sees cognitive development as a gradual advance toward more thorough and intelligent adaptation to environment marked by more complete equilibrium among psychological processes. Perception is fraught with illusion, instability and distortion which the child tempers by systematically collating information obtained from different points of view. A much higher degree of consistency and objectivity, combined with flexibility is afforded by the gradual acquisition of logical thinking, culminating in the scientific and formal reasoning of which the adolescent is capable. The symbolic operations that participate in thought are derived from concrete interactions with objects."

The most fundamental property of formal thought is the subordination of reality to possibility. Formal thought characterizes the adult mind.

Around the age of 12, on the average, a whole new set of operations come into play when the subject is faced with actual experimental problem involving meaning of

physical objects and calling for the discovery of physical laws. These consist of disjunctive competitions, exclusions and so on... unlike concrete thought which is limited to classification and ordering of matters of fact... formal thought starts from hypothesis - that is to say, the possible.

Thought & Language

Cambridge, M.I.T. Press, 1962.

■Instead of listing the deficiencies of child reasoning compared with adults, Piaget concentrated on what a child has. He demonstrated that the difference between child and adult thinking was qualitative rather than quantitative.

According to Piaget the bond uniting all the specific characteristics of child logic is the ego-centrism of the child's thinking. To this core trait he relates all the other traits he found such as intellectual realism, difficulty in understanding relations. He describes ego-centrism as occupying an intermediate position, genetically, structurally and functionally between autistic and directed thought.

The nature of the development itself changes from biological to sociocultural. Though development is determined by language, by the linguistic tools of thought and by the sociocultural experience of the child, the development of logic in the child is a direct function of socialized speech.

Socialization of thought is seen by Piaget as a mechanical abolition of the characteristics of the child's thought - their gradual withering away.

Piaget demonstrated that the child uses subordinate clauses with because, although, etc. long before he grasps the structure of meaning corresponding to these syntactic forms.

Piaget remained blind to the most important trait of ego-centric speech - its genetic connection with inner speech. This warped his interpretation of its functions and structures.

Compte rendu d'une entrevue avec le Professeur Morf de
l'Université de Montréal:

Nous avons fait des expériences pour examiner les structures logiques dont se servent les enfants. On remarque que l'enfant, jusqu'à l'âge de 12 ans ou moins, n'a pas une très bonne idée de la structure grammaticale. Jusqu'à l'âge de 7 ans, ne saisissant pas le sens de conjonctions comme "parce que" et "malgré que", il utilise l'une pour l'autre. De même, si on lui demande d'expliquer une phrase, il la répétera ou il parlera plus haut, mais il ne pourra pas l'élaborer en termes linguistiques. De plus, il ne peut pas distinguer les unités lexicales. Certes, il parle, mais en imitant les autres et sans s'apercevoir de la structure du langage. Il pourrait imiter une deuxième langue, avec la même facilité qu'il imite la première. Aussi pourrait-on lui enseigner facilement deux systèmes de mathématiques à la fois - un vrai et un faux.

L'enseignement d'une autre langue avant que l'enfant prenne bien connaissance des structures grammaticales ne peut que nuire à son développement intellectuel; car le système logique avec lequel il organise l'expérience d'un monde et du langage n'aura pas de stabilité. On peut mettre en doute ces propositions, en citant des cas d'enfants qui

parlent bien deux langues. D'après un examen superficiel, certes, l'enfant bilingue parlera bien; c'est-à-dire il ne fera pas d'erreur linguistique grossière. Sa connaissance des deux langues lui servira parfaitement bien s'il ne veut pas aller très loin dans ses études. Mais il ne pourra pas se servir du langage comme un outil intellectuel aussi bien que celui qui a eu une base sûre.

Domage qu'on n'ait pas fait d'expériences spécifiques pour examiner ces propositions. Les opinions que j'exprime sont tirées de mes expériences et celles des autres, surtout en Suisse, et des conclusions déduites de ce que nous savons du développement de l'intelligence chez l'enfant.

Les psychologues scolaires en Suisse ont découvert par exemple, que les enfants bilingues posent plus de problèmes pour l'enseignement - surtout pour l'enseignement de la grammaire. Aussi on s'aperçoit que certains bilingues manifestent une certaine réticence à parler. D'ailleurs, il leur est très difficile de corriger leurs fautes. Quand on apprend une deuxième langue après l'âge de douze ans, on peut se faire corriger sur des fautes de langage, mais quand on l'a apprise plus tôt, c'est presque impossible. Par exemple, les bilingues franco-allemands disent "aller en bas" qui est calqué sur l'expression allemande. - "hinuntergehen." Même si on leur dit qu'il y a une expression française - "descendre", il continueront à employer leur terme, qui n'est

pas du bon français, mais un exemple des mélanges qui se font dans un milieu bilingue.

On prétend qu'une langue s'apprend très facilement quand on est jeune et que plus tard il est difficile d'acquérir un bon accent. Aussi dit-on que l'enfant bilingue apprend tôt à séparer le mot de l'objet. D'abord, même si ces avantages existaient, il resterait à prouver qu'ils compensent les désavantages mentionnés ci-haut. De ma part, je ne crois pas que le bilinguisme précoce soit souhaitable. Et, on peut aussi bien acquérir l'accent plus tard. C'est uniquement une question de méthode. D'habitude on présente le vocabulaire et les structures grammaticales avant d'enseigner la prononciation. Alors l'élève peut tout de suite manipuler les mots, et il ne prendra pas le temps de corriger son accent. Si, au contraire, on enseigne la prononciation d'abord, sans expliquer le sens des mots, l'élève s'appliquera à imiter parfaitement la prononciation. Il aura alors une bonne base phonétique, qui veut dire, un bon accent dans la deuxième langue. Voilà mon expérience. On nous a appris d'abord à articuler le français et ensuite on nous a enseigné le sens des mots. J'ai appris le français à l'âge de douze ans, ce qui est, d'ailleurs, courant en Suisse.

Oui, je suis en faveur du bilinguisme, s'il est acquis après l'âge de 12 ans, avec une bonne méthode. L'individu qui ne connaît qu'une langue ou qu'une culture aura des difficultés d'adaptation dans le monde moderne, à moins

qu'il ne reste dans un milieu très fermé.

La méthode d'enseigner en répétant les mots n'a aucun sens. Ici je me trouve d'accord avec monsieur le professeur Lambert. On devrait illustrer les mots avec le plus grand nombre d'exemples dans autant de contextes que possible. Aussi doit-on utiliser une méthode qui convient à l'âge des élèves. A l'âge de douze ans, l'enfant manifeste un intérêt à l'égard des structures linguistiques comme aux rapports et aux structures du monde physique. La méthode transformationnelle de Chomsky me semble très efficace. Peut-être trouvera-t-on plus tard qu'il a négligé quelques aspects du langage mais, en principe, je trouve son idée très valable.

Il se peut que celui qui a appris sa deuxième langue simultanément pourra se rattrapper plus tard - si l'on s'occupait de ses problèmes. Mais c'est plus efficace d'avoir une bonne méthode d'enseignement.

Quant à M. Lambert - il s'occupe de l'enfant qui a réussi à maîtriser les deux langues et laisse les autres de côté. D'ailleurs, il n'examine pas les problèmes plus cachés et plus profonds du bilingue.

A mon sens, il y aurait un grand intérêt à étudier l'organisation de l'univers chez l'enfant et de la comparer à l'organisation de l'univers linguistique. Piaget a négligé ce domaine.

Remarques additionnelles sur l'entrevue

Il parait que l'opinion du Professeur Morf est très répandue en Suisse. Les instructeurs de langue française déplorent les mélanges de l'allemand (surtout le patois allemand) avec le français. Ces mélanges se font en syntaxe "Tu m'es au chemin", en morphologie - "delummer" au lieu "d'éteindre", ainsi qu'en vocabulaire "il faut schmirrer les bottes."

Comme évidence de l'influence néfaste du bilinguisme, on cite la ville de Bienne, où, dit-on, les gens sont tellement bilingues qu'ils ne savent plus quelle langue ils parlent. Des mélanges, comme ceux mentionnés ci-haut, sont acceptés dans l'usage normal. Tout ce qui est compris s'accepte, il n'y a pas assez de restriction normative. Ainsi la langue devient rapidement un patois. Cette façon de s'exprimer sera mal comprise hors de la localité particulière et ne pourra jamais servir comme outil précis de la pensée. Car, "C'est de la langue que la pensée reçoit sa forme, c'est par la langue qu'elle existe enfin réellement en dehors de nous-mêmes".¹ Par contre, la tradition anglaise s'occupe surtout de la valeur communicative du langage (peut-être est-ce la raison pour laquelle Lambert ne tient compte que du vocabulaire dans ses expériences sur le bilinguisme - le mot est le véhicule le plus compact et reconnu de communication). La tradition française a toujours pour sa part, considéré qu'il

existe un lien étroit entre la pensée et le langage. Donc perdre la précision du langage c'est perdre la clarté de la pensée; c'est cela que craignent les instructeurs en Suisse:

"Vous n'aurez jamais une tête claire, si vous vous habituez à un langage qui ne l'est pas." ²

"en se laissant aller à parler incorrectement....on perd le contrôle de soi-même. On perd la curiosité intellectuelle..."³

On trouve dans ces articles une exhortation directement opposé à celle de Penfield: "Car dès que l'enfant est capable d'entendre, avant même qu'il soit capable de comprendre, il est nécessaire que son oreille s'habitue à une seule langue."⁴

Aussi on fait les même recommandations que Morf: "N'apprendre la seconde langue que lorsqu'on saura la première assez à fond pour qu'il n'y ait plus de risque de contamination dans le vocabulaire et la syntaxe, portant de confusion dans l'esprit."⁵

1. A. Kuenzi, Pour la langue française, Bieler Jahrbuch, pp. 89-106 - p. 104
2. G. de Reynold, Sur le bilinguisme, Bieler Jahrbuch, 1928. pp. 101-116 - p. 107
3. Ibid., p. 109
4. Ibid., p. 110
5. Ibid., p. 111

H. Baungartner, Das Verhältnis des deutschpredenden Bieler 20 seiner Mundart, zur Schriftsprache und zumfranzösischen

Bieler, Jahrbuch, 1927, p. 61-88

vanGreyerz, O., Sprachkultur, G.

Bieler Jahrbuch, 1928, p. 89-100

Lombard, A. Une terre, Une langue

Edition de la Société de la Gazette de Lausanne, Lausanne, 1929

Peter Welsh, Plurilingualism in Switzerland

Final Report to the Commission on B. & B. Division VIII-B. Report No. 20

Morf:

Apprentissage d'une structure
logique concrète (inclusion)

Etudes Epistémologiques Génétiques -
ed. J. Pigaet - Vol. 9

Qu'est-ce qu'une structure logique? ... fonctionnellement, elle se manifeste par des inférences qui aboutissent à des conclusions certaines sans le secours d'aucune constatation.

La formation d'une structure opératoire telle que l'inclusion des classes ne peut pas s'expliquer par l'accumulation de constations relatives à des situations concrètes particulières.*

Cette formation n'est possible au contact des situations concrètes qu'à partir de schèmes préparatoires (de classification, d'emboîtement, etc) qui permettent déjà d'interpréter ces situations en termes de classes.

Quant au mécanisme même de cette formation, il consiste vraisemblablement dans le maniement actif de ces schèmes, maniement qui a pour effet non pas de les reformer, mais de les différencier, de les rendre plus mobiles et plus stables à la fois, et de les coordonner enfin en un système permanent et, comme tel, indéfiniment généralisable.

* Ceci peut avoir des implications pour la méthode directe d'apprentissage d'une deuxième langue, lorsque l'enfant est très jeune.

Morf:

Les relations entre la logique et le langage lors du passage de raisonnement concret au raisonnement formel

Etudes épistémologiques génétiques,
ed. J. Piaget, Vol. 3

Expérience:

Des situations-problèmes ont été présentées aux enfants de 7 à 15 ans. Les solutions aux problèmes faisaient appel à diverses combinatoires logiques - implication, incompatibilité disjonction, affirmation non-complète.

But de l'expérience

1) Est-ce que les erreurs, quand elles apparaissent en majorité pour les enfants d'un certain âge, se réduisent aux insuffisances d'ordre linguistique, ou aux défauts d'organisation opératoire?

Quand les réussites apparaissent en majorité pour un certain âge, est-ce à cause de l'évolution du langage ou d'un développement des opérations logiques?

2) Y-a-t-il moyen de créer, par de divers moyens d'apprentissage, raisonnements formels chez les sujets qui ne les utilisent pas?

Est-ce qu'on peut faire une distinction entre les aides linguistiques et les aides d'ordre opératoires?

Sujets

Des enfants, de 7 à 15 ans étudiant dans les écoles primaires et secondaires à Genève.

Résultat

Seulement les résultats d'un problème seront résumés ici; les autres problèmes ont eu des résultats analogues.

Histoire

"Epreuve 'Horloger'": "Dans une fabrique d'horlogerie, on recevait des réclamations parce qu'il y avait des montres qui étaient mal faites. Le directeur envoya un technicien qui a examiné les machines et qui a parlé avec les ouvriers, et après quelque temps il a téléphoné au directeur et lui a dit: "Jusqu'ici j'ai trouvé que toutes les montres que nous avons fabriquées au mois de septembre, ont des défauts. - Le directeur avait quelques montres devant lui et les regardait. Il a pris d'abord une montre (a) qui avait été fabriquée en septembre, et se dit: Voilà, celle-ci a été fabriquée en septembre, elle a donc un défaut. Pouvait-il dire cela? (b) Ensuite il prend une deuxième montre et se dit: celle-ci a été faite en juillet: alors je suis sûr qu'elle n'a pas de défaut. Pouvait-il le dire? (c) Puis il prend une troisième, dont il savait qu'elle avait un défaut, et se dit: celle-là a un défaut; alors je sais qu'elle a été fabriquée en septembre. Pouvait-il, etc... (d) Enfin il prend une quatrième et se dit: de celle-ci je sais qu'elle n'a aucun défaut; donc elle ne peut pas provenir du mois de septembre. Pouvait-il, etc..."

Réponses: Les réussites spontanées apparaissent en majorité dès la 13^e année. Elles atteignent ^{75%} vers la fin de la 15^e année.

Nature de l'erreur:

"L'erreur typique peut se décrire comme une symétrisation de la relation d'implication: la formule "toutes les montres fabriquées en septembre ont un défaut" est acceptée dans son sens propre, mais elle est en même temps convertie en "toutes les montres défectueuses ont été fabriquées en septembre". L'implication est donc traitée comme une équivalence.

La majorité des enfants - et en tout cas ceux qui ont plus de 9-10 ans, distingue bien les sens de "toutes les montres de septembre" et "seulement les montres de septembre".

On suppose naturellement une difficulté de langage: il se pourrait en effet que l'usage du terme de "tous" soit encore mal assimilé chez les sujets qui produisent cette erreur. Or nous avons constaté que la majorité d'entre eux - et en tout cas ceux qui ont plus de 9-10 ans - distinguent bien les sens de "toutes les montres de septembre..." et "seulement les montres de septembre..." lorsqu'on sort ces expressions du contexte de l'épreuve. -Voici la suite du même cas:

Une montre fabriquée en juillet, peut-on dire qu'elle n'a pas de défaut? - Non, elle n'a pas de défaut. - Tu en es certain? -

Oui. C'est seulement celles de septembre qui sont mauvaises.

Ex. 1 bis:

Il avait dit cela, le technicien? - Oui. - Est-ce qu'il a dit que celles des autres mois étaient bonnes? - Je ne me souviens pas. - (L'expérimentateur répète l'histoire et la fait répéter par le sujet; répétition correcte. Puis reprise de b): Oui, il peut le dire, parce que c'est seulement celles de septembre. - Est-ce qu'il a dit "toutes celles..." ou "seulement celles..."? - Toutes celles... - Est-ce pareil? - Non. - Mais cela veut dire la même chose à peu près? - Non, c'est pas la même chose. - Peut-on dire qu'une montre de juillet est bonne? - Oui, parce que seulement celles de septembre ont un défaut.(!) Etc.

Donc la difficulté n'est pas proprement linguistique mais relève de la nature de la situation d'ensemble.

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A côté des erreurs caractéristiques, on peut encore dégager une attitude préformelle, dont les manifestations sont diverses: il n'y a, d'abord, aucune tentative de déduire les solutions à partir du texte de l'épreuve: l'énoncé n'est intéressant que dans la mesure où il permet d'imaginer une situation concrète. Les conduites de solution s'appliquent alors à cette situation imaginée. Cette attitude va souvent jusqu'au doute sur les prémisses:

Ex. 23 - G. V., 9 ans 5 mois. Epreuve "Horloger".

(question d): elle avait peut-être été faite en septembre;
il y en avait peut-être quand même une de juste.

La fragilité de la relation classe-individu, que nous avons relevée à deux reprises, en est une autre expression. - Ajoutons-y enfin le refus de raisonner sur des éventualités, rencontré de temps en temps, qui traduit la prédominance des objets de l'opération elle-même.

Interventions didactiques

Moyens d'apprentissage:

- 1 - la simple répétition de l'histoire
- 2 - la correction du récit
- 3 - refus ou mise en doute d'une réponse
- 4 - la formulation explicite des prémisses
- 5 - l'analyse des classes et des hypothèses
- 6 - les exemples analogiques

Seulement l'apprentissage par analogie fut effectif.

"Mais, encore faut-il être très prudent: avons-nous, par cette intervention, vraiment créé dans l'esprit du sujet une structure formelle qui lui manquait auparavant?"

Certainement non, car tout ce que nous voyons dans de tels cas nous fait penser que nous sommes en présence de sujets qui sont déjà capables de raisonnement formel, mais qui, pour une raison qui reste à expliquer, ont agi en dessous de leurs moyens. Il y a d'ailleurs un cinquième

fait qui vient appuyer cette manière de voir: chaque fois que l'intervention ne se fait pas lors de la première épreuve, le sujet a déjà résolu un ou plusieurs problèmes analogues par des raisonnements formels.

On se demande, bien entendu, quel a été le rôle de l'exemple analogique dans ces cas ou, autrement dit, pourquoi il a été nécessaire.

D'une façon générale, on peut dire que c'est le contexte pratique qui a séduit les sujets, en les incitant par exemple à invoquer des relations causales où le texte n'en fait pas mention, ou bien en lui faisant compléter arbitrairement l'énoncé de l'épreuve.

Conclusion

1. Les conduites de solution propres aux sujets qui n'ont pas atteint le niveau de la logique formelle se caractérisent par des erreurs qui expriment toutes l'absence d'une combinatoire susceptible d'englober, en un système commun, tous les rapports entre classes. Ce défaut se traduit par une simplification des relations en jeu ou par la perte de certaines relations, entraînant à son tour des déformations de l'énoncé.

Il est vrai, d'autre part, que toutes les conduites de solution peuvent être décrites en même temps par leur aspect linguistique, par leur aspect opératoire (ou structural) et par l'attitude intellectuelle qui leur préside.

Mais l'analyse des erreurs a montré que l'aspect opératoire est primaire, et conditionne les particularités linguistiques; les interprétations défectueuses de l'énoncé, notamment découlent de la situation totale et non de leur formulation.

2. Le passage au niveau formel intéresse solidairement ces trois aspects. Il n'a pas été possible de saisir des décalages significatifs et constants entre l'évolution des opérations et celle des formulations ou interprétations linguistiques. - Cela ne signifie pas que ces décalages n'existent pas; il se peut que notre matériel soit trop hétérogène et pas assez abondant pour les déceler.

3. L'étude des interventions expérimentales et de leurs effets respectifs a confirmé les constatations de la première partie.

Ces interventions sont, de façon générale, dépourvues de succès: les systèmes opératoires ne pouvaient être "enseignés" là où ils n'existaient pas auparavant. On peut répartir ces interventions en trois groupes quant à leur efficacité:

La plupart d'entre elles n'ont aucun effet favorable, même sur les solutions partielles. Ni les efforts portant sur l'interprétation des énoncés, ni ceux qui tentaient de rétablir les relations négligées ou faussés dans le raisonnement, n'ont abouti à faire découvrir des structures d'ensemble qui faisaient défaut.

Le seul cas où les sujets ayant passé d'une conduite préformelle à des raisonnements formels est celui des changements d'attitude, trouvés exclusivement chez des sujets qui ont fourni des raisonnements formels dans d'autres épreuves; en plus, l'intervention qui avait seule cet effet favorable est l'"exemple analogique": or, pour reconnaître l'analogie il faut déjà avoir saisi plus ou moins la structure d'ensemble du problème.

1) La confrontation des conduites de solution propres à chacun des deux niveaux étudiés, semble montrer que la différence entre les raisonnements ne relève pas principalement d'un facteur linguistique mais de l'organisation des opérations.

2) Un "apprentissage" (dans le sens restreint que nous avons donné au mot ici) des structures formelles n'est pas possible.

BEHAVIORAL EVIDENCE FOR CONTRASTING FORMS OF BILINGUALISM¹

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It is a special pleasure for me, a psychologist, to be asked to talk to you about some of our work on language behavior. This is so because I have a personal conviction that neither linguists nor psychologists have become fully aware of the fact that both are studying often the very same phenomena of language with distinctively different methods, schemes of analysis, and ultimate purposes in mind. In light of these differences, when linguistic and psychological facts or laws do make contact or coincide, their significance for each discipline becomes appreciably richer and more meaningful. Opportunities extended to me by the Social Science Research Council's Committee on Linguistics and Psychology to meet with linguists for long periods have demonstrated clearly the value of contact for both groups. I don't believe that the fruitful consequences of contact require that we know one another's business or jargon to any great extent as long as both groups are willing to share major ideas, stating them in simplified terminology.

I hope that what I have to say here about bilingualism will illustrate the psychological approach to this fascinating topic. I have been helped in my work by my contact with Uriel Weinreich and Einar Haugen. I responded to their linguistic perspective of bilingualism as a psychologist. Whether they or other linguists will respond in turn to my psychological interpretation of bilingualism, thereby completing the cycle of contact, I can't really judge, but I do hope so.

The phenomenon of bilingualism had been examined by the more speculative, former generation of linguists long before psychologists considered it of special interest. In an exhaustive review of the literature on this topic, Weinreich (1953) reports several publications in which two forms of bilingualism have been identified.

¹ The work discussed here has been supported by the Canadian Defense Research Board and more recently by the Carnegie Corporation by grants to the Language Research Group at McGill.

Linguists have used various names to distinguish the two, e.g. "pure versus mixed," "organic versus inorganic," "subordinative versus coordinative." The distinction between the two forms has been made on the basis of differences in linguistic behavior of bilinguals such as the general or specialized usage of one or both languages, proneness to translate from one language to the other, or differences in connotations of words which are supposedly equivalent in the two languages.

The psychologist's interest in bilingualism centers on the effect upon verbal behavior and thinking of the acquisition and usage of two systems of signs. Following Osgood's development of a theory of meaning (1953) which uses a mediation principle as its pivotal concept, Ervin & Osgood (1954) formulated a theory of bilingualism which incorporates the linguist's notion of a bilingual dichotomy and relates the two types to the manner in which bilinguals acquire and use their languages.

Ervin & Osgood argue that the "meaning" of a sign (or word) is identical to the representational mediation process which that sign elicits in the organism. The mediation process is some form of neutral-system replica of the original reactions made to the referent or object signified by the sign. A "compound bilingual" is defined as one who possesses two sets of equivalent signs (one in each language) for the same class of referents. For example, the meaning of the English word "house" is identical with the meaning of its French equivalent "maison" since both these signs elicit the same mediators. A "coordinate bilingual" is defined as one who possesses two sets of signs which have comparatively less equivalence because the situations in which the two languages were learned were contextually separated and in some cases the actual referents of signs in the two languages are not identical or equivalent. Thus, the word "house" elicits its appropriate mediation process, while the word "maison" elicits a mediation process which is different to some degree from that elicited by "house." The coordinate may learn to translate "house" by "maison" as well as note the similarities between the objects referred to by the two signs, but the meaning of these two words will remain different, usually being subjectively experienced as a difference in connotation or appropriateness of reference.

From these definitions, specific kinds of language experiences are conducive to the formation of compound and coordinate bilingual

systems. Thus, the so-called "indirect" method of language learning (e.g., "maison means house," taught in the classroom) favors the development of compound bilingualism since the new sign ("maison") is directly conditioned to the mediators already existing for the sign "house." It is evident that all meanings which are assigned are of the compound type. In contrast the "direct" method of language learning promotes coordinate bilingualism. Also, bicultural experience such as the use of French exclusively in France by an Englishman, favors the development of a coordinate system since the French signs tend to be conditioned or re-conditioned to new referents and experiences. "Specialization" in language usage (e.g. using French exclusively at home but English at work in bilingual communities) also promotes a coordinate system since the two languages are likely to become functionally independent.

We were first interested in testing the mediation theory of bilingualism by examining certain behavioral manifestations of the functional dependence or independence of bilingual language systems and relating these to the manner in which bilinguals learned their two languages (see Lambert, Havelka & Crosby, 1958). We contacted a large number of English-French bilinguals and interviewed them extensively in order to be confident in categorizing them either as *coordinate* if their languages were learned in situationally, culturally, or temporally distinctive settings, or as *compound* if the two languages were learned in essentially the same situation or through translation methods, or if they were used interchangeably. We also tested their comparative skill in the two languages and kept in our samples only those who were "balanced" in their bilingual skill (see Lambert, 1955).

Our first idea was to see how well compound and coordinate bilinguals would be able to keep their languages independent in a learning task. Each bilingual was given a list of 20 English words to memorize and then was given a second list to learn, the second list consisting of translation-equivalent French words for each of the original 20 English words. Here's the problem: from the theory, we predict that coordinates would keep their two languages separated in this task while compounds would show an interaction of the two languages. The results support this prediction clearly since compounds were able to profit from the interpolated French-equivalent list of words and *improved* their retention of the original English list while coordinates were disrupted by the translation equivalents and even forgot much of the original English list. That is, learning

a series of words like "father, garden, church," etc., is more vividly remembered by compound bilinguals after they have rehearsed a series of equivalents such as "père, jardin, église," etc., while coordinates are bothered by the learning of the equivalents.

Our next prediction was that compound bilinguals would have more similar meanings for translated equivalents than would coordinates. Here we examined the two groups' patterns of meanings of translated equivalents using Osgood's semantic rating procedure (see Osgood, et al, 1957) which was designed to measure connotative meanings of words. The results are clear: if coordinate bilinguals learn their languages in culturally distinctive settings then they have comparatively different patterns of meanings for common words such as house and maison, poor and pauvre, me and moi than have compound bilinguals. That is, the meanings of equivalents such as "house-maison" or "poor-pauvre" are more distinct for coordinates who have learned their two languages in culturally segregated settings than for compound bilinguals. This finding does not hold for coordinates who have learned their languages in situationally segregated contexts within one cultural setting as in Montreal. Semantic distinctiveness apparently demands quite contrasting acquisition contexts whereas functional independence of the two language systems as noted in the memorization problem is developed more readily in a greater range of distinctive settings, not necessarily culturally segregated ones.

Our third test of the theory involves a new idea. Suppose we could by some method eliminate or reduce the meaning of a word in one language, what would be the effect of this meaning reduction for equivalents in the other language? We would predict that compounds would manifest the reduced meaning cross-linguistically whereas the coordinates should not show as much of any cross-linguistic effect from meaning reduction in one of their languages.

We have developed a method for reducing the meaning of a word by repeating it until its meaning is "satiated" (see Lambert & Jacobovits, 1960), for example repeatedly saying "house, house, house, etc." for a 15 second period. When measured on semantic rating scales, it is observed that the intensity of connotative meaning is systematically reduced by word repetition.

Groups of French-English coordinate and compound bilinguals were tested for cross-linguistic satiation. Concepts such as "cuisine" or "father" were continuously repeated by a subject for a 15 sec.

period and then the translated-equivalents ("kitchen" and "père") were presented one time and the extent of meaning change was measured for these translated-equivalents. The compound bilinguals behave as expected here: repetition of "cuisine" reliably reduces its connotative meaning and that of its equivalent, "kitchen." The co-ordinant bilinguals, however, show no reliable satiation of the meaning of repeated words nor do the translation-equivalents reflect a cross-linguistic satiation effect. In fact, continuous repetition of a word in language A actually *increases* the intensity of meanings of translation-equivalents in language B (see Jakobovits & Lambert, 1932). We have more work to do on this problem but at present we feel that these results are highly suggestive of quite different (and intriguing) processes underlying compound and coordinate bilingualisms.

We have made other deductions from the psychological theory of bilingualism which were not supported and as a consequence of attempting to explain these cases, we have been led to new predictions and to likely modifications of the theory. I have only time enough to give you the general outline of these studies and the new ideas stemming from their findings. Compound and coordinate bilinguals were asked to learn a mixed series of English and French words and to remember which words were associated with electric shock—a slight one administered to one finger. It wasn't long before the word "verte" or "boy," for example, would lead to a rapid pressing of a key which eliminated the occurrence of shock. After this habit was well learned, we introduced (along with other new control words) the translations of shocked words such as "green" and "garçon." Here we expected compound bilinguals to be more prompt than coordinates in pressing the key for the other-language equivalents of shocked words, arguing that the association of shock with "verte" for compound bilinguals would more likely also associate with "green" than would be the case for coordinates whose languages we assume function more independently. But we found no differences between the groups here (see R. Olton, 1960).

In a further procedure (R. Olton, 1960) bilinguals learned a mixed list of English and French words and later were presented a longer list and asked to pick out the words memorized from among new words and translation-equivalents of those originally learned. For example, "glove" and "printemps" might have been on the list to be learned originally while only their translations ("gant" and "springtime") would be on the final list. Thus the subjects were

forced to switch languages rapidly in memorizing the list but also remember which words appeared in which language. We would predict that compounds would make more errors in confusing "glove" with "gant" than would coordinates, but no reliable differences appeared. In both procedures all bilinguals showed cross-language generalizations, a finding of importance for the theory of mediated generalization. For the compound—coordinate problem, however, the results either indicate that these tests were too subtle or poorly executed, or that the procedures used prompted both groups to behave in a translation—alert manner, making coordinates appear as compounds.² This latter line of reasoning has led us to a new hypothesis concerning various procedures which involve rapid language switching and their effects on the thinking of bilinguals. The central notion under current examination is that experimental procedures which encourage a readiness to switch languages may modify the behavior of coordinate bilinguals and make them indistinguishable from compounds. We hope to be able to delineate such conditions, if they exist.

Psychology can of course make profitable contacts with other disciplines than linguistics. I have found it particularly interesting in the study of language to be sandwiched between linguistics on one side and physiological-psychology on the other. McGill University offers a splendid opportunity to learn about the important work of Hebb and Milner as well as Penfield and his associates. Donald Hebb in particular has encouraged me to think about the possible neurological implications of our work. In his recent book (D. O. Hebb, 1958, p. 104f) Hebb outlined one manner in which groups of neurological cells could function as either "fused" or "separated" systems—hypothetical neurological analogues of compound and coordinate systems.

Hebb's thinking suggested the possibility of indirectly testing the neurological features of compound and coordinate bilingualism. A long history of medical reports are available on bilinguals who have become aphasic, sometimes "losing" one of their two languages, other times "losing" both. We went through the published cases (mainly compiled in Europe) to determine if compound and coordinate classifications could possibly be made on the basis of how aphasic bilinguals originally acquired their two (or more) languages.

² This possibility might also account for our failure to find compound-coordinate differences in speed of translation mentioned in the Lambert, Havelka, Crosby study.

The findings of this study (Lambert & Fillenbaum, 1959) are of special interest because they suggest the possibility of someday linking linguistic, psychological and neurological principles. The argument here is that the functional relations of the bilingual's two languages have some systematic neurological representation in those areas of the brain necessary for language. In view of the behavioral evidence of functional dependence or independence of bilinguals' languages, we speculated that coordinate bilinguals should have more functionally separate neural structures underlying their languages than should compound bilinguals. Thus, concepts like "church" and "église" should be stored in neural elements which have some sort of greater functional discreteness for the coordinate bilinguals. It follows that brain damage which results in aphasia would be more likely to affect both languages of the compound bilingual but should lead to more selective disturbances for coordinates. The results of our analysis of aphasic patients are in line with these predictions: those cases which suggest a compound bilingual background typically show a generalized disorder affecting both languages whereas those cases with a coordinate bilingual background typically show more specific-language disorder following aphasia.

Throughout these studies, a psychological theory, based on the thinking of Charles Osgood and Donald Hebb, has functioned as an analytic guide. It generated a host of predictions, the testing of which has extended our understanding of bilingual behavior. The general picture is getting progressively clearer: converging evidence dealing with the learning and thinking processes of bilinguals supports the notion of functionally dependent language systems for those who acquire their two languages in a compound fashion and of functionally independent systems for those who acquire their languages in a coordinate fashion. Still there are certainly many intriguing features to be uncovered which have not even been conceptualized as yet.

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Psychological Approaches to the Study of Language

*Part I: On Learning, Thinking and Human Abilities**

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MY ASSIGNMENT was to set forth and explain certain subject matter and research from the field of psychology that, if included in the training of language specialists, would enrich their understanding of the phenomena of language and increase their efficiency as teachers of foreign languages. Accordingly, I have selected various psychological approaches to language that seem to me to be of instructive value and practical use to language teachers. These particular approaches were selected because they promise to be of permanent value both in explaining the known facts about language and in orienting future research. To limit the scope of this paper, no consideration will be given to other psychological developments that could be of value to language teachers even though they do not deal with language specifically. For example, language teachers and their trainers could profit from a careful study of current research in the psychology of personality and the problem of attitude changes. Psychological work on these matters suggests means of selecting those who would be most effective as language teachers, and indicates effective ways of forming favorable attitudes towards other cultural groups—matters as important as they are neglected in educational research.

My aim is to introduce briefly the basic ideas and implications of each approach, as I see them, with a view of enticing foreign language specialists to turn to the more complete accounts which are referred to in the references.

1. Theories of Learning of Relevance for Language Specialists

Since its beginning as an independent discipline, psychology has considered the phenomena of language and the language learning process as important matters falling within its

field of specialization. But since World War II, a surge of interest in the cognitive aspects of behavior and the development of new methodologies have generated a widely-felt hope that perhaps now psychologists can systematically study the phenomena of language rather than speculate about them. Today many psychologists are starting to teach courses and conduct research on "verbal behavior," "psycholinguistics," and "language and thought." This new attitude stems from advances, perhaps normal ones, in many fields of specialization that feed into psychology, for example, advances in the neurology of brain functioning, in statistical and experimental procedures, in the design and operation of computers, and in methods of language teaching. As a response to these developments, psychologists are beginning to extend their principles and theories beyond the level of animal research (so very necessary for the establishment of basic principles in the first place) to the more complex behavior of man. Currently, all major theories of learning concern themselves with language and the growing body of empirical data on the subject. The following discussion of two contemporary learning theories is needed to understand the current psychological interest in two basic processes: meaning, the symbol-referent problem, and verbal behavior, how words are used in communication, either as units or as elements in larger response sequences. What follows is a very brief sketch of two contrasting learning theories, one dealing with meaning, the other with verbal behavior. There is nothing necessarily inconsistent in a discipline having more than one scheme of analysis to integrate facts and explain events,

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especially when these are as complex as learning and human cognitive behavior. As more data becomes available, two or more theories of learning may prove to be necessary, or as others very convincingly argue¹ a single set of principles may ultimately draw the two schemes together.

The contrast here is between what are called "classical" and "instrumental" forms of conditioning or learning. "Classical" refers to Pavlov's notions about the response conditioned to an unnatural stimulus. In this case, a stimulus with some "natural" or built-in evocative tendency (such as a hammer tap on the patellar tendon of the knee which evokes an involuntary muscular kicking response) can be replaced by a stimulus that is "unnatural" for such a response (such as the sound of a bell). The unnatural stimulus takes over the evocative capacity of the natural stimulus when the two stimuli are repeatedly paired in the order bell—hammer tap, bell—hammer tap, etc. for a long series of presentations. Several notions are of importance in this statement. A stimulus which has a natural response sequel is a required ingredient; this is the "unconditioned" or uncontaminated element. The knee jerk is *not* a natural sequel to the hearing of a bell, and when a bell—knee jerk connection is finally made, the kick response is referred to as a "conditioned" response and the bell is called a "conditioned" stimulus. The time separating the conditioned and unconditioned stimuli is of major importance. The two stimuli must be nearly simultaneously presented, the conditioned stimulus (the bell) coming a fraction of a second earlier than the unconditioned stimulus. It is not known how this transfer of evocative capacity takes place; psychology and neurology have had and will continue to have fun trying to understand the process. But the empirical facts are very dependable. Pavlov's dogs salivated (a conditioned response) to the sound of a bell (a conditioned stimulus) when bell and food were repeatedly paired. And Pavlov's dogs were not special in this respect. Literally thousands of experiments have demonstrated the phenomenon with organisms at nearly every level of the phylogenetic scale.

The evocative capacity of the conditioned stimulus, when on its own, is ephemeral; it must

be "re-charged" by being periodically paired with the unconditioned stimulus. The repeated association of the two stimuli permits the transfer of evocative capacity and there must be periodical re-association of the two if the transferred capacity is to be maintained. When fully charged the conditioned stimulus itself can be repeatedly paired with a second unnatural stimulus (for example, the flash of a light) permitting the second conditioned stimulus to pick up the charge in the sense that it, too, can evoke the "conditioned" response. This chain of events is referred to as "second-order" conditioning. If a second conditioned stimulus which is *similar* in some sense to the first is introduced for the first time, it will also have an evocative capacity to call out the conditioned response. The conditioning is said to "generalize" to related stimuli, the degree of generalization depending on the degree of similarity between the original conditioned stimulus and the "similar" stimulus. If the original bell had a tone quality of 300 cycles per second, generalization would likely take place to a tone of 325 or 275 cycles per second.

Note in this argument that the conditioned stimulus (the hearing of a bell) functions as a signal or sign that something is to come, somewhat analogous to a symbol relating to its referent. The organism comprehends that the bell "stands for" the hammer tap and it is likely that a mental image of the hammer tap eventually occurs when the signal is received, as though some mental replica of the actual referent is evoked by the symbol because of changes within the nervous system introduced by the continual pairing of stimuli. Here, in compressed form, is the psychological basis for the relation of symbols to referents. Charles E. Osgood² has made this extension of the theory especially clear. For Osgood, the meaning of a sign or symbol is the mental or neurological counterpart, in attenuated form, of the actual emotional and behavioral responses that have habitually been made to the referent for which the symbol stands. That is, linguistic symbols are originally learned in a context

¹ See O. H. Mowrer, *Learning theory and the symbolic processes*. New York: Wiley, 1960. Chaps. 3 and 4.

² C. E. Osgood, *Method and theory in experimental psychology*. New York: Oxford University Press, 1953.

where they are repeatedly paired with their appropriate referents. An infant hears the word "dog" repeated several times while in the presence of an actual dog and in time whatever emotional and behavioral reactions are elicited by the presence of the actual dog are transferred to the symbol "dog." Symbols then come to evoke some miniature replica of the actual responses made to the referent, and these responses, referred to as "representational mediational responses," constitute the meaning of the symbol. They *represent or stand for* the full pattern of responses made to the referent, they *mediate or link* the responses made to the referent with those made to the symbol, and they are some form of nervous system response, hence their label, "representational mediational responses."

Osgood uses this scheme to explain how meanings are developed directly through classical learning principles or how meanings are "assigned" to us, ready-made so to speak, by "teachers" in our social environment. Because Osgood's conceptualization of meaning has the advantage of integrating a wide range of empirical facts, and because it has stimulated so much current research,³ it should be of particular value in the teaching of languages. It offers a new and instructive orientation to meaning and it will suggest methods of studying the development, assignment and modification of meanings—matters of everyday concern to language teachers. Comparisons can be made of methods of teaching languages and their effectiveness in developing vivid and persistent meanings. The work of Staats and Staats indicates how favorable (or, inadvertently, unfavorable) emotional components of meaning can be assigned to foreign language vocabularies as they are being learned. The work of Lambert and Jakobovits shows how meanings can be dissipated or "satiated" when continuous repetition of words takes place, as in vocabulary drill.

Other psychologists are interested in "associative meaning," that is, the organized interrelations of verbal associations.⁴ Verbal associations are determined by asking subjects to give the first word that comes to mind after they think about a particular word given them. For example, *night* popularly leads to *day* and *day* to *break* or back to *night*, etc. Verbal linkages of

this sort are learned according to principles or "laws" of association, in particular the laws of contiguity, similarity and frequency. One association leads to another apparently because they have frequently occurred in sequence in the past, in much the same way as contiguous elements become linked in classical conditioning.

This group of researchers is less concerned with the symbol-referent problem than with the reliable or common patterns of verbal associations themselves. They have been able to determine the similarity of associative meanings of words by their associative overlap. For example, Deese noted that *piano* and *symphony* do not associate directly with one another but they both elicit a common set of associations among college students: *note, song, sound, noise, music* and *orchestra*. Sub-groups of individuals of similar age and educational background have very similar associative networks. (There are some interesting exceptions. For example, some have closed associative networks, where *night* leads to *day* and *day* to *night*, whereas others, with quite different personalities, have wide open networks with little or no circular units.)

Foreign language teachers could utilize these common associative structures to advantage in their teaching procedures. For instance, vocabulary training might be patterned on the common networks of native speakers of the language. As students become skilled in their second language, fascinating studies of the networks in the two languages could be conducted. Certain associative networks might be found to be similar in the two languages while

³ C. E. Osgood, G. J. Suci, and P. H. Tannenbaum, *The measurement of meaning*. Urbana: University of Illinois Press, 1957.

Carolyn K. Staats, and W. W. Staats, "Meaning established by classical conditioning." *Journal of Experimental Psychology*, 1957, 54, 74-80.

W. E. Lambert, and L. Jakobovits, "Verbal satiation and changes in the intensity of meaning." *Journal of Experimental Psychology*, 1960, 60, 376-383.

⁴ W. A. Bousfield, "The occurrence of clustering in the recall of randomly arranged associates." *Journal of General Psychology*, 1953, 49, 229-240.

J. J. Jenkins, and W. A. Russell, "Associative clustering during recall." *Journal of Abnormal and Social Psychology*, 1952, 47, 818-821.

J. Deese, "On the structure of associative meaning." *Psychological Review*, 1962, 69, 161-175.

others are dissimilar. If so, one might then examine the dissimilar networks as sources of semantic interference between languages. Furthermore, grammatical or syntactical structures in two contrasting languages could be studied with this procedure. For example, Lambert⁵ noted that the French noun-adjective word order affected associative networks in a quite different fashion from the English adjective-noun word order.

None of the richness of language is lost in the treatment given it by these psychologists. In fact, they contribute to its richness by highlighting its complexity. They do not claim to have made much more than a start, but few will disagree that they have started a promising movement of language research. The excitement of the psychologist in the study of meaning, noted especially in the work of Osgood and Mowrer, contrasts with the uninterested treatment given the problem by most linguists.

B. F. Skinner of Harvard is the best known modern exponent of a contrasting form of learning known as instrumental (operant) conditioning.⁶ The distinctive characteristic of instrumental learning is the importance attributed to the consequences of responses (reinforcers) in influencing the strength of these responses. Consider the case of an animal that, presumably in his exploration and random activity in a puzzle box, accidentally depresses a lever situated at one end of the box. The box is typically rigged so that on depression of the lever the animal immediately receives some desired outcome. For a cat in a puzzle box, the lever depression can open a door and release the animal; for a hungry white rat or pigeon, the lever pressing may deliver a pellet of wanted food. Getting out or getting wanted food are examples of "reinforcements" or rewards. Timing is crucial in this form of learning, especially the interval separating the organism's *response* (lever pushing) and the reception of *reinforcement* (food pellet). Note that in this case there is no close temporal pairing of an unnatural stimulus with a natural one as was the case in classical conditioning. Instead, attention is given to the development of a brand new response that is brought under the management of other people in the environment (in this case the experimenter who controls the food-delivery mecha-

nism) who control the doling out of reinforcements when the appropriate response is made. Once the reinforcement has been received, the response potential is raised and it will be noted that on further trials the organism will more quickly move closer to the lever and, with consistent reinforcement, will execute the new act with polished efficiency. When reinforcements are withheld, the lever-depression habit will gradually be "extinguished," that is, the animal will refrain from pressing the lever. Signals can be introduced to inform the animal when it is appropriate to respond. For example, a light can be flashed to indicate that the lever-pressing will now lead to reinforcement. After practice, the animal will differentiate when it is worthwhile responding and when not. The basic plan can be complicated when two animals learn to cooperate. Skinner describes how two pigeons can be taught to respond in coordination if food reinforcement is given both for a coordinated set of responses. With this example, Skinner moves his attention up to the intricate level of cooperative behavior and his experimentation suggests that simple forms of animals are docile enough to learn at least the rudiments of cooperative behavior.

Food is only one type of reinforcement which proves effective. Animals will also learn complicated patterns of response to escape from confinement or from fearful settings, or they will learn how to turn on a light when subjected to darkness. If the reinforcement is given with care, the animal will learn precise response sequences, but if the reinforcements are administered haphazardly, the nature of the habit learned will also be vague and over-generalized. The reinforcements need not be regular, however. If the reinforcements are presented only a certain proportion of times (some responses reinforced and others not) the habit is often more rapidly learned and better retained than when reinforcements are given consistently. When they are given, however, the reinforce-

⁵ W. E. Lambert, "Developmental aspects of second-language acquisition." (Parts I, II, & III.) *Journal of Social Psychology*, 1956, 43, 83-104.

⁶ B. F. Skinner, *The behavior of organisms*. New York: Appleton, 1938.

B. F. Skinner, *Science and human behavior*. New York: Macmillan, 1953.

ments must be precisely timed. Animals will often learn "superstitions" or unnecessary elements of responding. For example, a pigeon may have stretched its neck just before pecking an electronically-active button. The pecking response leads to food reinforcement, but for the animal the total sequence (neck stretch and then peck) is learned, so that neck-stretching regularly precedes the pecking response, in much the same way as a baseball batter will spit in his hands, knock the dirt from his cleats, and twist his cap as he waits for a pitch.

In his major work on "verbal behavior," Skinner⁷ views the learning of language in essentially the same terms he uses to analyze the development of simple habits. Drawing on certain descriptive facts about the infant's extensive repertoire of sounds, Skinner argues that others in the baby's environment give reinforcements for the production of certain sound patterns and thereby restrict his range of sounds and make more probable certain oral productions. The parents or siblings must wait for the child to produce (presumably in his random verbalizations) something which is close enough to "belonging" so that they can realistically reinforce the attempt. For example, an infant's "baba" may be close enough to "mama" to surprise and please a new mother, and her excitement may be transmitted to the infant in the form of affectionate and spirited attention. This attention is an example of reinforcement, and in this sense the child should be launched on a word-learning program. The reinforcements used are more social in nature than was the case with the animal studies mentioned above. It is argued that the infant and child will learn symbols for objects in his environment because he thereby gains a control over people and things. Saying "milk" or something close enough to be understood as "milk" gets him something he wants. If his attempt is not recognizable, he suffers a frustrating delay in getting things which prompts him to be more exact. Following the pattern of instrumental learning, the word learner also learns to be a "demander" if he consistently gets what he asks for, i.e., if he is reinforced for demanding.

If the child's socializers hold off reinforcement until the verbal response is clear and appropriate, his use of words will be precise.

However, others are often unable to check on the appropriateness of a response. When a child says he has a "stomach ache" (a very private feeling) he may actually have a pain in the intestinal region. The child may receive sympathy and some general pain reliever and thereby incidentally be reinforced for the idea that "stomach" runs from the throat region to the groin, with no differentiation being called for. On the other hand, the skill of the literary artist who can precisely describe very private emotional states is likely attributable to his having received appropriate reinforcements. Thus, infants, children and adults may be precise or sloppy in their use of words depending upon the exactitude with which reinforcements have been administered to them for their verbal attempts.

It is characteristic of Skinner to leave matters such as semantics to others. His writings are marked by his zeal to be a "descriptive behaviorist," meaning that he wants to keep his attention on observable behavioral responses and to relate them to such observable environmental events as reinforcements. Any theorizing about internal mental or neurological processes is scorned by him and his large host of followers. Meaning is considered as a mentalistic concept and he tries to explain language without reference to it. He is hampered in this attempt because his theory is limited.⁸ Consequently it may appear that he approaches psychological matters much as an engineer might, given the two notions that simple responses can be quantified and that certain reinforcements are effective when properly administered. It is difficult for those not aware of Skinner's desire to help psychology become a "science" to understand his hard-headed position. However, in view of recent developments in cognitive and neurophysiological psychology, an imaginative person like Skinner must feel that being forced to be consistently the descriptive behaviorist is really being left with a very sticky wicket.

But the practical implications of this movement should be well understood by language

⁷ B. F. Skinner, *Verbal behavior*. New York: Appleton, 1957.

⁸ C. E. Osgood, "Language in the objective mode: The question of sufficiency." *Contemporary Psychology*, 1958, 3, 209-212.

specialists. Much important research has issued from his basic notions, much of it of direct relevance to the language learning of human subjects. For example, it has been clearly demonstrated that well-established verbal habits (some simple,⁹ and others more complex¹⁰) can be modified under certain schedules of reinforcement. In these studies, subjects are typically reinforced by the experimenter's saying "good" or "uh-huh" when, for example, the plural forms of nouns or particular pronouns are used in sentence constructions. Because of the reinforcement, the tendency to use the reinforced forms is markedly increased. Barik and Lambert found that complex structures can also be modified by verbal reinforcement. For example, a person who habitually forms his sentences in the fashion: "This is the (house) that (burned) last night" can be trained to shift to the form "This is the (house) that (I saw) burning last night." Apparently these modifications take place without the subject becoming aware of any relation between the experimenter's saying "good" and his own behavior, although this point is not certain as yet.¹¹ These developments can be of immediate importance for language teachers who can be either effective or ineffective as social reinforcers of their students' attempts to develop appropriate verbal habits.

The most recent development in Skinner's thinking is evident in his interest in programmed learning and teaching machines.¹² Mechanical modes of instruction are old ideas in psychology. They didn't catch on in the 1930's but are being enthusiastically entertained today, perhaps because Skinner is such a convincing proponent and because there has been a value shift toward mechanized instrumentation (gadgets) in this era. Skinner argues that teaching machines in certain respects are more effective than are teachers. The machines escape the problems of developing potentially unhealthy interpersonal dependencies between pupils and teachers. Furthermore, programmed machine instruction is tailor-made to each student's learning pace. The machines also control the timing between the pupil's response and his reinforcement (in this case, reinforcement is the realization that he was correct and that he may now move on to the next step). Furthermore, since the machine teaches so effectively, the

student feels he is clearly progressing in his task and is much better motivated than is the case in most classrooms. Experienced teachers who are not psychologists should study this new development, comprehending its origins. And they should study it soon before it's too late, since so much money will be invested in these potentially useful procedures that educationists will be unable to evaluate objectively their long-term effectiveness in teaching. For this purpose experimentation should be started soon. They may have a strong initial or novelty effect with teen-agers that diminishes rapidly. The programmed materials should be tested in classroom settings *without* the machines themselves. The creation of good programs depends on a personal skill. Programs can be of great help for teachers who do not have the time or ability to analyze course content into its most logical steps. On the other hand, programs should be carefully examined by specialists in human abilities (see section 3 below) to be more certain that the sequencing of steps is actually psychologically appropriate and maximally beneficial.

2. Neurophysiological Bases of Thought and Language

As we have seen, Skinner focuses attention on observable responses, including speech, and, in the manner of a skilled technician, indicates how response patterns can be developed, manipulated and modified. The empirical research of those adopting this approach is impressive and usually of great practical value. Because the proponents of the approach reject the use of theory, they also contribute little to psychological theory and this bias may eventually limit the movement's contribution to psychology. An important counter-movement, developed particularly during the past fifteen years, is probing much deeper into the organism than

⁹ J. Greenspoon, referred to in L. Krasner, "Studies of the conditioning of verbal behavior." *Psychological Bulletin*, 1958, 55, 148-170.

¹⁰ H. C. Barik, and W. E. Lambert, "Conditioning of complex verbal sequences." *Canadian Journal of Psychology*, 1960, 14, 87-95.

¹¹ D. E. Dulany, "Hypotheses and habits in verbal 'operant conditioning.'" *Journal of Abnormal and Social Psychology*, 1961, 63, 251-263.

¹² B. F. Skinner, "Teaching machines." *Science*, 1958, 128, 969-977.

those interested only in response patterns care to. This group is interested in inside mechanisms, those processes going on within the nervous system of people when they speak and comprehend others speaking. These processes have been alluded to by Osgood in his description of meaning, likely because Osgood's own thinking has been guided by this movement. In fact, neurophysiological psychology is becoming one of the most popular areas of specialization for academically trained psychologists. The theories and research findings of this group should be of interest for teachers of language, at least for those who have seriously pondered the magical complexity and beauty of language, and for those who may be discouraged about psychology's role in the study of language because they have primarily encountered technician-type psychologists.

One of the chief catalysts in this new movement is Donald O. Hebb.¹³ His aim in psychology has been to extend the significance of psychological concepts, especially those concerned with complex cognitive processes, by relating them to what is known about the neurology of the central nervous system. As a consequence of attempting to make this integration, he has liberalized some neurophysiological concepts and theories far beyond the known facts, and, at the same time, he has forced most psychologists to become interested in the workings of man's nervous system and brain, stimulating many of them to search for neurophysiological correlates of psychological phenomena.

What are his basic ideas? First of all, he feels that the study of thinking should be psychology's major concern, and thought processes are the central theme of his own work. He is interested in how contacts with the environment leave their residues or traces within the nervous system, how, in other words, the nervous system stores up images and memories which can later be called into play often without the intervention of environmental stimulation. All the evidence in neurology and physiology made it clear that the brain is in a continuous state of activity, slowing down only in deep sleep. Other evidence suggested that nerve cells were so distributed that one cell could activate neighboring cells. When an appropriately interconnected family of cells received one unit of

stimulation, it would be passed on to the whole family. If, as seems to be the case in certain centers of the brain, the family unit of cells were appropriately intermeshed, a stimulation from one cell would lead on to another and, in a chain-like fashion, the stimulation would ultimately come back onto the *first* cell again. In such a fashion a stimulated network could store the input signal and maintain its fidelity long after the environmental stimulation had ceased. Not only were there networks of cells found in the brain which might become reverberatory circuits of this sort, but it was also noted that the transition points from one cell to the next often involve a physical enlargement, a "terminal end bulb." These bulbs it is argued might facilitate transmission within a circuit; in fact it may be that the bulbs develop from regular and continuous contact between certain nerve cells. Once a circuit unit has become established it would be possible either for outside stimulation to activate the whole unit or for some other *inside* stimulation coming from another point in the continuously active nervous system to activate it.

These reverberatory circuits Hebb calls "cell assemblies." It is apparent that such systems as these could¹⁴ well be the neural centers underlying the mediating processes described by Osgood. Representational mediation processes, considered by Osgood to constitute meaning, could have the biological form of assemblies of cells. Cell assemblies could become conditioned responses to verbal symbols so that they are activated when a symbol is recognized in either its auditory or visual forms. The activation of assemblies could revoke the complex of responses formerly made to the referent for which the symbol stands as Osgood's theory demands.

¹³ D. O. Hebb, *Organization of behavior*. New York: Wiley, 1949.

D. O. Hebb, *A textbook of psychology*. Philadelphia: Saunders, 1958.

¹⁴ The word "could" is used here because the cell assembly is not a verified entity; it is a theoretical construction. Neurophysiology has not yet advanced to the point where on-going processes can be precisely studied and defined. Hebb has used evidence of a *static* sort, such as histological diagrams of interconnected nerve cells and end bulbs, and hypothesized about active states of nervous integration, keeping his theory in line with the facts known about active states derived from external manifestations of brain activity, such as electro-encephalographic recordings.

Cell assemblies, according to Hebb, can have elements in common with other functionally distinct assemblies. For example, in a series such as ABCDX and ABCDY (where each letter stands for a cell assembly and the whole series makes up what he refers to as a "sequence" of assemblies) two different sequences can have certain assemblies in common. This postulate of the theory suggests that there may be a neural mechanism whereby root words can take on various endings and yet be recognized as derived from a common core. Synonyms, too, can be thought of as having certain assembly elements in common. Hebb argues that two originally distinct assemblies of cells which habitually play functionally similar roles can become fused into a single neural system if no new element is introduced to reinstate their distinctiveness. Furthermore, two very similar networks of cell assemblies can develop more permanent distinctiveness if some elements are regularly found to play discriminable roles. In this fashion, Hebb describes how either fused or separated neural systems could develop. Such systems could, in turn, help explain how we can be precise in our use of synonyms and antonyms in language and how bilinguals manage to keep second-language equivalents functionally distinctive from first-language concepts. Recent theorizing about coordinate and compound bilingual systems have profited from Hebb's perspective.¹⁵ A recent paper by P. Milner,¹⁶ a colleague of Hebb, discusses a mechanism of neural inhibition which helps account for the bilingual's control over inter-lingual interference. Milner indicates that certain adjacent neural structures function in a reciprocal manner so that when structure X is activated the adjacent structure Y is automatically made inactive and unable to be stimulated. This mechanism may turn out to be an explanation of how bilinguals can keep their languages functionally segregated in usage, especially in the case of "coordinate" bilinguals (see Section 4 below). That is, when the sequence of cell assemblies underlying the concept "house" is activated, the correlated neural assemblies underlying the concept "maison" may automatically be made inactive. Or when the neural mechanisms underlying a *total language system*, such as English, is activated, it may make the

potentially competing system inactive.

Hebb is interested, as was K. S. Lashley before him,¹⁷ in how complex sequences of responses can be so perfectly coordinated as is the case with the arpeggios of a skilled violinist or the rapid speech of native speakers of a language. Hebb argues that the appropriate serial ordering of such sequences is determined both by the "sensory feed-back" received when a single response is completed and by the action of mediating processes or cell assemblies within the central nervous system. A sequence of cell assemblies could have some order built into it during the course of its development into a sequence. But Hebb feels this would not likely be sufficient. Take the case of the arpeggio. A violinist can perform up to 16 finger movements a second. The precise timing of the different responses cannot be determined by feedback from each preceding movement because there is insufficient time. There are only about 50-60 milliseconds available before the next response, and the established reaction time for tactual stimulation is much slower, taking 140 milliseconds. But Hebb believes that possibly the feedback from the first response to the brain *could* regulate the fourth or fifth output in the long sequence, so that precise ordering could be achieved. In a similar fashion, Hebb argues that a speaker's sentence construction cannot be explained "as a series of CR's (conditioned responses) linked together by feedback alone," or as entirely controlled by cell assemblies, since there are strong indications that his thought processes (controlled by cell assemblies) run well ahead of his actual articulations. Apparently some word ordering and grammatical

¹⁵ Susan Ervin, and C. E. Osgood, "Second language learning and bilingualism." In C. E. Osgood and F. Sebeok (Eds.), "Psycholinguistics." *Journal of Abnormal and Social Psychology*, Supplement, 1954, 49, 139-146.

W. E. Lambert, J. Havelka, and Cynthia Crosby, "The influence of language-acquisition contexts on bilingualism." *Journal of Abnormal and Social Psychology*, 1958, 56, 239-244.

W. E. Lambert, and S. Fillenbaum, "A pilot study of aphasia among bilinguals." *Canadian Journal of Psychology*, 1959, 13, 28-34.

¹⁶ P. M. Milner, "The cell assembly: Mark II." *Psychological Review*, 1957, 64, 242-252.

¹⁷ K. S. Lashley, "The problem of serial order in behavior." In L. A. Jeffress (Ed.), *Cerebral mechanisms in behavior*. New York: Wiley, 1951, pp. 112-136.

sequencing must first be decided on, then rapidly scanned and found appropriate, and finally set in motion while active thought moves on ahead to the next phase. This whole chain of processes is remarkably fast and "automatic" in the native speaker, making a sharp contrast with the novice in a language who slows the process way down and makes evident to listeners that his thought and speech are running nearly in parallel.

For Hebb, *both* the mediating processes in the form of cell assemblies and sensory feedback must be necessary for the precise temporal sequencing required for normal speech. The background accompaniment of one's own speech testifies to the role of sensory feedback in speech. When the feedback of one's own speech is very slightly slowed down mechanically¹⁸ one hesitates and is often unable to continue his normal speaking. Because of the inquisitiveness of men like Hebb and Lashley, we can look forward to continued research directed toward an understanding of how speech sequences occur.

Concepts, too, apparently have a neurological sub-structure. Hebb discusses how the concept of triangularity, for example, develops. As a consequence of the interplay between visual stimulation of triangular figures and ocular-motor adjustments made to them, a sequence of cell assemblies is activated in those areas of the brain sensitive to visual stimulation (referred to technically as cortex region #17). Neurological findings have established that other areas of the cortex are concurrently active when cells are activated in area 17. For example, area 18 cells are concurrently made active when the cells in area 17 are stimulated by direct neural routes from the retina of the eye. It is argued that cell assemblies may be formed in area 18 and these may become electro-chemically active whenever *various different* sequences fire in area 17, each area 17 response corresponding to a *particular* type of stimulation. Thus the co-related activity in area 18 is conceived of as the neural basis of a generalized concept, for example, of triangularity. Area 18 receives impulses from different assemblies in area 17 and also sends neural impulses to area 17 whenever a particular activity takes place in area 17, as though the conceptual system could indicate to the sensory

receiving area that the new instance of stimulation belongs to a concept already established. Just as the visual system has its theoretically-possible "conceptual" neural centers, so other regions in the cortex very likely have a similar capacity for the conceptual development of other than visual information. These hypothetical centers concerned with the more generalized functions hold out a fascinating promise. They suggest that some day we will be able to understand more comprehensively the mechanisms which make possible the development and use of thought and language.

3. Language Aptitude and the Theory of Human Abilities

Psychology as a discipline offers a specialization in the study of "individual differences." Practitioners of this specialty, often referred to as psychometricians, make use of a number of skills, including competence in statistical procedures and their application to the theory, construction and evaluation of psychological tests. Psychometricians have historically been called on to answer questions about the nature of intelligence and human abilities and they have developed some of psychology's most comprehensive conceptualizations of human capacities and behavior. Because of their training and interests, psychometricians have been concerned with the selection and placement of personnel in academic and applied settings. Several, through personal interest in the nature of language, have studied the nature of language aptitude, carefully constructing batteries of ingenious tests designed to measure individual differences in such a capacity. Their products usually are about the closest to good science one can find in the social or biological sciences. Their contributions are often not fully appreciated because of naiveté on the part of those who ultimately use their theories and tests. It is not often understood, for example, that each of the tests in a battery usually has a long and interesting history, and any test finally used must add its special predictive power to the total battery of tests. From the patterning of subjects' responses to the items of reliable

¹⁸ B. S. Lee, "On delayed auditory feedback." *Journal of the Acoustical Society of America*, 1950, 22, 639.

and distinctive tests come theories of intelligence and aptitude.

We will be concerned here with the current work of one of these specialists, Dr. John B. Carroll of Harvard University who, with Stanley Sapon, developed an instrument of obvious value for those in the field of language—the Modern Language Aptitude Test.¹⁹ In the following paragraphs, we will describe the test, indicating its usefulness in educational research and placement, and then discuss how this test is related to a theory of human abilities developed by George A. Ferguson of McGill University. Certain papers by Carroll²⁰ and Ferguson²¹ are suggested as important summaries of the relevant features of their thinking.

The learning of a foreign language is one of the most difficult of human skills to develop. Furthermore, language training is expensive. One could argue from these two facts alone that military, governmental and educational institutions must select those who can most certainly profit from prolonged training, just as piano teachers and parents must select; to the majority of piano students, they communicate the fact that they have little chance for excellence. But just as a thorough introduction to piano can have important personal and educational value, so too can a series of well-taught introductory courses in foreign languages. Carroll turns his attention to the selection of those with great potential for languages, and in doing so his study of the components of language aptitude reveal for us the component skills that must be taught by teachers and learned by students. Future research will certainly reveal other components, and, of equal significance, it may also lead to a better understanding of the sequence or order in which these component skills should be learned and how best they can, if possible, be developed.

What are some of these components of language aptitude? The following extensive quotation gives a summary of Carroll's answer.

"Our current thinking tends to consider language aptitude under the following headings:

(1) One of the most important variables in learning a foreign language is phonetic coding, the ability to "code" auditory phonetic material in such a way that this material can be recognized, identified and remembered over something longer than a few seconds. . . . Thus, this ability

is not the ability to make an echoic response to phonetic material, but the ability somehow to "code" or represent it in imagery so that it can be recognized or reproduced after an intervening period filled with other activity. This ability, it would seem, is measured chiefly by the *Phonetic Script* test, in which the individual has to learn how a series of speech sounds are represented by alphabetic characters; . . .

In learning a foreign language, a person low in this ability will have trouble not only in remembering phonetic materials (words, forms, etc.) but also in mimicking speech sounds.

(2) A second important variable in language aptitude is the ability to handle "grammar," i.e. the forms of language and their arrangements in natural utterances. This implies that the individual is sensitive to the functions of words in a variety of contexts. . . . It is postulated that this trait is particularly well measured by the *Words and Sentences* subtest of the Modern Language Aptitude Test battery.

(3) A third important variable is that of rote memorization ability for foreign language materials. This ability . . . has to do with the capacity to learn a large number of these associations in a relatively short time. . . . We may postulate that the *Paired Associates* test measures this ability fairly accurately; it is also tapped by the *Number Learning* test.

(4) A fourth variable . . . is the ability to infer linguistic forms, rules and patterns from new linguistic content itself with a minimum of supervision or guidance. It is not measured to any appreciable degree by the tests of the present final MLAT battery, but it had turned up in certain earlier studies.

The above four factors do not include what is ordinarily called the *verbal* or *verbal knowledge* factor, which according to our results is not very important in predicting success. Vocabulary tests do not serve as particularly good predictors, at least in situations where other tests serve well, since the first stages of learning a language do not require one to acquire a large vocabulary. On the other hand, the present *Spelling Clues* test functions in part as a vocabulary test."

Carroll's evaluation of the test (summarized in his 1960 paper) indicates its great potential in selection and in educational research. The fact that the test is more valid in some settings than

¹⁹ J. B. Carroll, and S. M. Sapon, *Modern language aptitude test*. New York: Psychological Corporation, 1958.

²⁰ J. B. Carroll, "A factor analysis of two foreign language aptitude batteries." *The Journal of General Psychology*, 1958, 59, 3-19.

J. B. Carroll, *The prediction of success in intensive foreign language training*. Cambridge: Graduate School of Education, Harvard University, 1960 (Mimeo.).

²¹ G. A. Ferguson, "On learning and human ability." *Canadian Journal of Psychology*, 1954, 8, 95-112.

G. A. Ferguson, "On transfer and the abilities of man." *Canadian Journal of Psychology*, 1956, 10, 121-131.

in others suggests that variables other than aptitude itself must also be involved in language learning efficiency. Carroll mentions that variables such as adequacy of presentation of the material, adequate opportunity to learn, individual differences in general intelligence, and motivation to learn may vary from situation to situation. In fact, in the final section of this paper we will discuss the role of certain other variables. It should be realized that Carroll expects that there will be modifications and improvements in the analysis of language aptitude.

What does Carroll mean by "aptitude?" He views aptitude as a "relatively invariant characteristic of the individual, not subject to easy modification by learning." This stable personal characteristic manifests itself in the rapidity of progress or advancement made in language learning when the language is well taught, particularly when the teaching is geared to the basic intelligence of the learner.

Carroll, therefore, views language aptitude as a relatively stable personal characteristic, one which is made up of various component skills or "abilities." It will be instructive to consider what is meant by "abilities" since they play such a fundamental role in more complex aptitudes.

Ferguson views abilities as relatively invariant aspects of behavior that manifest themselves in modes of responding to particular psychological tests. Thus one's "intelligence" is his peculiar pattern of abilities that have become stabilized for him at his particular age level. Abilities are developed through overlearning. The stability of behavior that characterizes an ability reflects the fact that little change in behavior occurs as learning is continued. Basically, then, individuals vary in terms of the speed with which they reach this point of behavioral stability, and also in terms of the level of skill attained before the stability manifests itself. These individual differences, Ferguson argues, can be attributed to some complex by-product of biologically transmitted capacity and the type and amount of "learning which occurs at particular stages of life." Ferguson agrees with Hebb that the sequencing of what is taught (and learned) at particular stages of the organism's development is of

prime importance. "Early learning or its lack may have a permanent and generalized effect in the adult." Ferguson develops the important notion that "a slow learner under given learning conditions may have a capacity for ultimate performance in excess of the fast learner under the same training conditions." Likewise, people may have the abilities to learn rapidly in the earlier stages of learning, then perform so well, in relation to others, that they might not be prompted to acquire the necessary next-level abilities needed for later stages of learning. As a consequence, they might find themselves showing a stability of performance in the face of further training. This deceleration would not be due so much to a capacity difference as to poor sequencing of the learning of abilities; the point here is that there is proper and necessary order for the acquiring of abilities.

The sequencing problem may be crucial; Ferguson argues that "an individual will learn more readily activities which are facilitated by prior acquisitions, and will learn less readily those activities which are not facilitated or are perhaps inhibited by prior learning." He also notes the likelihood that the transfer effects from previously acquired abilities are of greatest importance in the early stages of learning new activities. Ultimately, learning for the adult involves in large part a transfer and integration of appropriate components from previously acquired abilities. Future research, following from such a theory as Ferguson's, may indicate how this integration of abilities may be properly taught and properly learned.

Perhaps the most important notion which emerges from this approach is a novel one for most people: man's abilities are not permanently fixed by hereditary background. "This position is no longer tenable. Although it is conceded that biological factors fix certain boundaries, all the evidence seems to suggest that the range of variation that results from learning is, indeed, very great. If this is so, it immediately raises questions of value and social responsibility. It means that a society, through control of the environment and the educative process, can in some considerable degree determine the patterns of ability which emerge in its members."

The implications of this view of abilities for

language teachers are immense. Over and above its value as a general theory, it offers various practical guides: that the learning of languages should be shifted to early age levels, and that experimentation on such a shift should be undertaken with very careful consideration given to ability requirements and their sequencing. It suggests that modern movements should be carefully studied to determine which students, according to their patterns of abilities, will profit from such new approaches. For example, the generalized plan of commencing second languages audio-lingually at all age levels probably has not taken into consideration age level changes in ability structures, nor individual differences in visual and auditory preferences at any age level.²² It may well be that the audio-lingual method is appropriate for second language learning at very early levels for

certain children, but it may, for older subjects, run counter to ability patterns developed over many years.

The theory also suggests that the next steps in language aptitude research might profit from a consideration of which abilities, such as those isolated by Carroll, typically show themselves at specific age levels. The sequencing of training in different skills could capitalize on normal age-level emergences of particular ability patterns. As a first step in this direction, those ability patterns that are considered basic to language aptitude could be isolated for children and adolescents at various age levels.

(To be concluded in the next issue.)

²² UNESCO, *L'enseignement des langues vivantes*. Paris, 1955, pp. 77 ff.

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*Psychological Approaches to the Study of Language**

Part II: On Second-Language Learning and Bilingualism

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4. A Social Psychology of Second-Language Learning

When viewed from a social-psychological perspective, the process of learning a second language takes on a special significance. From this viewpoint, one anticipates that if the learner is appropriately oriented, he may find that by learning another social group's language he has made the crucial step in becoming an acculturated part of a second linguistic-cultural community. Advancing toward biculturality in this sense may be viewed as a broadening experience in some cases, or it can engender "anomie," a feeling of not comfortably belonging in one social group or the other. With a different orientation, a language learner may look on his learning task as making him better educated or more cultured, or as equipping him with a useful skill for his future occupation, with little regard for the culture or the people represented by the other language. In other circumstances, one might consider learning another group's language as a means of getting on the "inside" of a cultural community in order to exploit, manipulate or control, with clearly personal ends in mind.

A series of studies carried out at McGill University has been concerned with such topics, and various findings have increased our confidence in a social-psychological theory of language learning. This theory, in brief, holds that an individual successfully acquiring a second language gradually adopts various aspects of behavior which characterize members of another linguistic-cultural group. The learner's ethnocentric tendencies and his attitudes toward the other group are believed to determine his success in learning the new language. His motivation to learn is thought to be

determined by his attitudes and by his orientation toward learning a second language. The orientation is "instrumental" in form if the purposes of language study reflect the more utilitarian value of linguistic achievement, such as getting ahead in one's occupation, and is "integrative" if the student is oriented to learn more about the other cultural community as if he desired to become a potential member of the other group. It is also argued that some may be anxious to learn another language as a means of being accepted in another cultural group because of dissatisfactions experienced in their own culture while other individuals may be equally as interested in another culture as they are in their own. However, the more proficient one becomes in a second language the more he may find that his place in his original membership group is modified at the same time as the other linguistic-cultural group becomes something more than a reference group for him. It may, in fact, become a second membership group for him. Depending upon the compatibility of the two cultures, he may experience feelings of chagrin or regret as he loses ties in one group, mixed with the fearful anticipation of entering a relatively new group. The concept "anomie," first proposed by Durkheim²³ and more recently extended by Srole²⁴ and Williams,²⁵ refers to the feelings of social uncertainty or dissatisfaction which sometimes characterize not only the bilingual but also the serious student of a second language.

* Continued from the preceding issue.

²³ E. Durkheim, *Le suicide*. Paris: F. Alcan, 1897.

²⁴ L. Srole, *Social dysfunction, personality and social distance attitudes*. (Paper read before the American Sociological Society, 1951, Chicago, Illinois.)

²⁵ R. M. Williams, *American society*. New York: Knopf, 1952.

We are viewing the learning of a second language in much the same way as Mowrer interprets the child's learning of his first language. Mowrer's fascinating "autistic" theory²⁶ differs in an essential manner from Skinner's approach to the matter. For Mowrer, word learning in talking birds and children takes place when the *sounds* of words have come to carry a reinforcement power in themselves so that the learner *wants* to produce words. The sounds become reinforcing agents through association with the *users* of words who are held in affection by the learner. Language learning is motivated by a basic desire to be like valued people in one's environment, first family members and then others in the linguistic community. A successful learner has to identify with language users to the extent that he wants to be like them linguistically, and undoubtedly in many other ways. It is not the case, as Skinner would require it, that the learner must emit words and have them immediately reinforced. All that is necessary, Mowrer makes clear, is for the word to be said by the bird *trainer* or the child's *mother* and have this sound followed by a reinforcing state for the learner (in the form of reception of food for the bird or affectionate handling for the child). "The secondary (autistic) reinforcement provided by the sound of the word is alone sufficient to bring it (the word) into existence." In similar fashion we argue that the learner must want to identify with members of the other linguistic-cultural group and be willing to take on very subtle aspects of their behavior such as their language or even their style of speech. We also feel that there are various types of motivation which can underlie his willingness to be like the other group's members and we are interested in explicating each of these.

The first studies²⁷ were carried out with English-speaking Montreal high school students studying French who were examined for language learning aptitude, verbal intelligence, attitudes toward the French community and intensity of motivation to learn French. Our measure of motivation is conceptually similar to the index of interest in learning a language that Jones²⁸ found to be important for successful learning among Welsh students. A factor analysis indicated that aptitude and intelligence formed a factor that was independent of

a second comprising indices of motivation, type of orientation toward language and social attitudes toward French-Canadians. A measure of achievement in French was reflected with equal prominence in both factors. In this case, then, French achievement was dependent upon both aptitude and intelligence as well as a sympathetic orientation toward the other group. This orientation apparently sustained a strong motivation to learn the other group's language. In the Montreal setting, it was clear that students with an integrative orientation were the more successful in language learning in contrast to those instrumentally oriented. (We have not concentrated on the manipulative orientation mentioned earlier and we are aware that a certain degree of error in classifying students may occur until attention is given to this form of orientation.)

Gardner's 1960 study confirmed and extended these findings. Using a larger sample of English-Canadians and incorporating various measures of French achievement, the same two independent factors were revealed, and again both were related to French achievement. But whereas aptitude and achievement were especially important for those French skills stressed in school training, the acquisition of French skills, whose development depends on the active use of the language in communicational settings, was determined solely by measures of an integrative motivation to learn French. Further evidence indicated that this integrative motive was the converse of an authoritarian ideological syndrome, opening the possibility that basic personality dispositions may be involved in language learning efficiency.

Information had been gathered from parents

²⁶ O. H. Mowrer, *Learning theory and the symbolic processes*. New York: Wiley, 1960. (See especially chapters 3 and 4.)

²⁷ R. C. Gardner and W. E. Lambert, "Motivational variables in second-language acquisition." *Canadian Journal of Psychology*, 1959, 13, 266-272.

R. C. Gardner, *Motivational variables in second-language acquisition*. Unpublished Ph.D. thesis, McGill University, Redpath Library, 1960.

²⁸ W. R. Jones, "Attitude towards Welsh as a second language. A preliminary investigation." *British Journal of Educational Psychology*, 1949, 19, 44-52.

W. R. Jones, "Attitude towards Welsh as a second language. A further investigation." *British Journal of Educational Psychology*, 1950, 10, 117-132.

about their orientation toward the French community. These data supported the notion that the proper orientation toward the other group is developed within the family: students with an integrative disposition to learn French had parents who also were integrative and sympathetic to the French community. The students' orientations were not related to parents' skill in French nor to the number of French acquaintances the parents had, indicating that the integrative motive is not due to having more experience with French at home but more likely stems from a family-wide attitudinal disposition.

A study by Anisfeld and Lambert²⁹ extended the experimental procedure to samples of Jewish high school students studying Hebrew at parochial schools in Montreal. They were administered tests measuring their orientation toward learning Hebrew and their attitudes toward the Jewish culture and community, as well as tests of verbal intelligence and language aptitude. These tests were correlated with measures of achievement in the Hebrew language at the school year's end. The results support the generalization that both intellectual capacity and attitudinal orientation affect success in learning Hebrew. However, whereas intelligence and linguistic aptitude are relatively stable predictors of success, the attitudinal measures vary from one social class school district to another. The measure of a Jewish student's desire to become more acculturated into the Jewish tradition and culture was sensitive for children in a district of Montreal where socio-psychological analysis of the nature of the Jewish population's adjustment to the American Gentile culture suggested that these particular Jews were concerned with problems of integrating into the Jewish culture. In another district, made up of Jews more recently arrived in North America who were clearly of a lower socio-economic class level, the measure of desire for Jewish acculturation did not correlate with achievement in Hebrew whereas measures of pro-Semitic attitudes or pride in being Jewish did.

More recently, students undergoing an intensive course in French at the French Summer School of McGill University were examined for changes in attitude during the study period.³⁰ Most were American university students or secondary school language teachers who re-

ferred themselves more to the European-French than the American-French community in their orientations to language learning. In this study, it became apparent that feelings of anomie were markedly increased during the course of study. As students progressed to the point that they "thought" in French, it was noted that their feelings of anomie also increased. At the same time, they tried to find means of using English even though they had pledged to use only French for the six-week period. The pattern suggests that American students experience anomie when they concentrate on and commence to master a second language and, as a consequence, develop stratagems to control or minimize such feelings.

The most recent study³¹ compares 10-year old monolingual and bilingual students on measures of intelligence. Of relevance here is the very clear pattern that bilingual children have markedly more favorable attitudes towards the "other" language community in contrast to the monolingual children. Furthermore, the parents of bilingual children are believed by their children to hold the same strongly sympathetic attitudes in contrast to the parents of monolingual children, as though the linguistic skills in a second language, extending to the point of bilingualism, are controlled by family-shared attitudes toward the other linguistic-cultural community.

These findings are consistent and reliable enough to be of more general interest. For example methods of language training may be modified and strengthened by giving consideration to the social-psychological implications of language learning. Important recent work by Paul Pimsleur and his associates lends support to our findings and the general theory.³² Be-

²⁹ M. Anisfeld and W. E. Lambert, "Social and psychological variables in learning Hebrew." *Journal of Abnormal and Social Psychology*, 1961, 63, 524-529.

³⁰ W. E. Lambert, R. C. Gardner, H. C. Barik, and K. Tunstall, "Attitudinal and cognitive aspects of intensive study of a second language." *Journal of Abnormal and Social Psychology*, to appear in 1963.

³¹ Elizabeth Peal and W. E. Lambert, "The relation of bilingualism to intelligence." *Psychological Monographs*, to appear in 1963.

³² P. Pimsleur, L. Mosberg, and A. V. Morrison, "Student Factors in Foreign Language Learning." *Modern Language Journal*, 1962, 46, 160-170.

cause of the possible practical as well as theoretical significance of this approach, it seemed appropriate to test its applicability in a cultural setting other than the bicultural Quebec scene. Our most recent study²² was therefore conducted in various regional settings in the United States, two of them also bicultural and a third more representative of "typical" urban American cities. The bicultural settings permitted an examination of attitudes working two ways: attitudinal dispositions of American students toward linguistic minority groups in their immediate environment and the general attitudes of members of the cultural minority group toward the general American culture about them. In this study, we were interested in comparing the importance, in the language learning process, of intellectual ability and language learning aptitude, on the one hand, and social attitudes toward the "other" language group and motivation to learn the language, on the other hand. Our attention was first directed to an examination of how these variables affect the language learning of American students who come from homes where only English is spoken. In order to compare the results of the United States investigation with earlier studies carried out with English-speaking students learning French in Montreal, we chose two samples of students from bicultural American communities in Louisiana and Maine. A third sample of American students was drawn from the public school system of Hartford, Connecticut, considered representative of most large city school systems along the Eastern coast of America. The Connecticut setting did not have a distinctive sub-community of Franco-Americans in its immediate environment comparable to those in the Louisiana and Maine districts studied. Thus, the Hartford students would not be expected to have a clear linguistic cultural group in their immediate experience toward which favorable or unfavorable attitudes would have developed through direct contact.

A large battery of tests was administered to these students early in the year, and near the end of the year, tests of achievement in French were given, and grades in French were obtained from teachers. The tests were intercorrelated and factor analyzed. The resulting patterns of

interrelations were studied and interpreted. The results indicate that, similar to the Montreal studies, two independent factors underlie the development of skill in learning a second language: an intellectual capacity and an appropriate attitudinal orientation toward the other language group coupled with a determined motivation to learn the language.

The second phase of the investigation was concerned with the role of aptitudinal, attitudinal and motivational variables in the linguistic development of potentially bilingual Franco-American students—those coming from homes in which primarily French was spoken. Two samples of Franco-American high school students were chosen from the Louisiana and Maine settings. The analysis indicated the manner in which social attitudes toward their own linguistic group and the American culture around them influence their (a) progress in becoming bilingual, (b) retaining the dominance of French, or (c) developing dominance of English. The manner in which the Franco-American student faces and resolves the cultural conflict he is likely to encounter in the American society was found to determine his linguistic development in French and English.

The third phase of the study focused on a comparison of Franco-American students from the Louisiana and Maine settings. The results make it very clear that whereas the Louisiana French culture is rapidly merging into the general American culture, the Maine community of Franco-Americans enjoys a comparatively dynamic and distinctive existence.

The fourth phase compared the Franco-American and American students in their various competences in French and in their attitudinal dispositions. The results reinforce the finding mentioned above of the cultural conflicts faced by Franco-American students. Furthermore, the Maine Franco-Americans show a decided superiority over the American students in their French skills whereas the Louisiana

P. Pimsleur, R. P. Stockwell, and A. L. Comrey, "Foreign language learning ability." *Journal of Educational Psychology*, 1962, 53, 15-26.

²² W. E. Lambert, R. C. Gardner, R. Olton, and K. Tunstall, *A study of the roles of attitudes and motivation in second-language learning*. Mimeographed, McGill University, 1962.

Franco-Americans show little or no advantage in French over American students.

The fifth phase of the study examined the stereotypes both American and Franco-American groups of students hold toward French people. The analysis indicates that all groups except the Maine Franco-Americans hold unfavorable stereotypes of French people. The Maine Franco-Americans give evidence of a basic pride in their French heritage. The consequences of holding negative stereotypes toward the very people whose language one is supposed to learn become apparent in this analysis.

The sixth and final phase deals with the role of students' values in the language-learning process. The results indicate that achievement in foreign language training is not a central goal for American students. Rather it is apparently incidental to the more challenging goal of trying to find and prepare one's way for the future. Intelligence coupled with a value placed on achievement are major determiners of success in most school work, including the study of language.

These findings not only supply needed information about the student learning languages, they also point the way to a large number of next steps to be taken in the fascinating study of language learning and bilingualism.

5. *A Psychology of Bilingualism*

Psychologists are now becoming interested in systematically studying how one acquires a second language and how certain individuals are able to make efficient use of two or several languages. A group of us at McGill University have found the Montreal bicultural setting to be an outstanding field station for research on bilingualism. But we have also noted that the linguistic backgrounds of actual bilinguals are often too complex for experimental studies. As a consequence, we have been forced often to restate certain bilingual problems in a more general form so that they can be investigated with experimental methods that only approximate the real bilingual case.

Our first step was to develop means of measuring individual variations in bilingual skill.³⁴ This work assumed that linguistic habits should be revealed in tests calling for speed of response, a commonly accepted measure of habit

strength. It was hypothesized that students with different amounts of study experience in a second language should show a corresponding facility in responding with the second language when required to. It was found that students at three progressively more advanced stages of experience with French showed progressively greater speed of responding to directions given them in French. This speed of response measure correlated highly with active vocabulary in French.

In a second study³⁵ a large number of tests were administered to students at various levels of skill in a second language, ranging from undergraduate experience to native-like competence. The pattern of results on these tests suggested that one's degree of bilingualism is reflected in his ability to perceive and to make efficient use of the words in either language. These studies made it evident that an adequate conceptualization of bilingualism should account for individual differences. That is, one person can show equal facility in his two languages and yet be comparatively a limited person in both languages. Another person can be intellectually brilliant in both his languages and equally skilled in both. Thus, we introduced the concepts of "bilingual balance," where a person shows essentially similar skills in both languages, and "linguistic dominance," where there is a measurably greater facility in one of the individual's two languages. Questions then arise as to how bilingual balance is best nurtured and what the psychological concomitants of balance are. Also, it has been intriguing to search out the motives and learning settings that promote dominance, especially cases where the *acquired* language becomes dominant over the first-learned language.

The next step was to study the "route" which leads to bilingualism.³⁶ Students at various levels of experience with a second language

³⁴ W. E. Lambert, "Measurement of the linguistic dominance of bilinguals." *Journal of Abnormal and Social Psychology*, 1955, 50, 197-200.

³⁵ W. E. Lambert, J. Havelka, and R. C. Gardner, "Linguistic manifestations of bilingualism." *American Journal of Psychology*, 1959, 72, 77-82.

³⁶ W. E. Lambert, "Developmental aspects of second-language acquisition." (Parts I, II, and III.) *Journal of Social Psychology*, 1956, 43, 83-104.

were given a series of tests differing in the complexity of their content. The results indicated that students have to surmount progressively more difficult levels of skill in order to approach native-like performance in their second language. The easiest level to master involved the acquisition of vocabulary and grammatical skills. Then the student must become experienced to the extent that he can react automatically in the second language. Then he faces the problem of surmounting a "cultural" barrier where, for example, he thinks in terms of culturally appropriate concepts, such as those revealed in the type and form of free associations given in the second language. At this stage, too, he must acquire a native-like accent in his second language. We have become interested in how the perfect accent is learned and we use a theory of "identification" with members of the other linguistic group to explain this process.

It is of psychological interest to understand how bilinguals can learn two symbols for each referent and yet manage to use each language system with a minimum of inter-lingual interferences. Consideration of this problem led us to examine the implications of theories of "coordinate" and "compound" bilingualism, proposed by linguists,³⁷ and recently examined by psychologists.³⁸ This theory states that bilinguals who have learned their two languages within one context will develop a "compound" bilingual system wherein the symbols of both languages function as interchangeable alternatives with essentially the same meanings. A "coordinate" system would be developed when the language-acquisition contexts were culturally, temporally or functionally segregated. This form of learning would promote bilinguals whose two sets of symbols would correspondingly be functionally more distinct and independent. We have tested these notions and have found that the learning contexts are apparently critical in determining the form of bilingualism which ultimately develops. Behavioral differences are measurable in terms of inter-lingual independence and degrees of similarity between meanings.³⁹ Coordinate bilinguals in contrast to compounds apparently can keep their two languages more functionally separated. They may be aided in this respect by the fact that they

have distinctive connotative meanings for translated equivalents in their two languages. Furthermore, when the meaning of a symbol in one language is reduced through overuse, the other-language equivalent is *not* co-reduced as is the case for compound bilinguals.⁴⁰ We have also examined the implications of coordinate and compound systems among bilinguals who become aphasic.⁴¹ Bilingual aphasics who learned their languages in a coordinate fashion are more likely to lose the use of only one of their two languages if they become aphasic whereas compound bilinguals show a more general language deficit affecting their two languages when they become aphasic.

This line of research suggests that inter-lingual interference is reduced for coordinate bilinguals by the intrinsic distinctiveness of their two languages while compound bilinguals may have to rely more on cues emanating from the language-usage contexts in order to minimize the potential interference. That is, compound bilinguals may be more prone to switch from one language to another if the context, in which communication takes place, prompts them to switch. For example, another communicator's use of a word or phrase from language X might prompt the compound bilingual to switch to language X; or the physical features of one member of a group might suggest that this person belongs to a particular linguistic group and be a sufficient cue for a compound to use a particular language. If the context provides various conflicting cues, the compound bilingual

³⁷ U. Weinreich, *Languages in contact*. New York: Linguistic Circle of New York, 1953.

³⁸ Susan Ervin and C. E. Osgood, "Second language learning and bilingualism." In C. E. Osgood and F. Sebeok (Eds.), "Psycholinguistics." *Journal of Abnormal and Social Psychology*, Supplement, 1954, 49, 139-146.

³⁹ W. E. Lambert, J. Havelka, and Cynthia Crosby, "The influence of language-acquisition contexts on bilingualism." *Journal of Abnormal and Social Psychology*, 1958, 56, 239-244.

W. E. Lambert, *Behavioral evidence for contrasting forms of bilingualism*. Georgetown Round Table Conference, 1961, to appear in volume on proceedings.

⁴⁰ L. Jakobovits and W. E. Lambert, "Semantic satiation among bilinguals." *Journal of Experimental Psychology*, 1961, 62, 576-582.

⁴¹ W. E. Lambert and S. Fillenbaum, "A pilot study of aphasia among bilinguals." *Canadian Journal of Psychology*, 1959, 13, 28-34.

would be more likely to encounter inter-lingual confusions. The point here is that the coordinate bilingual would be less dependent on the cues stemming from the language-usage context because of the "built-in" distinctiveness of his two language systems. Future research will examine the validity of such notions as these.

Methods of teaching a second language take into account this matter of inter-lingual interference. For example, the "direct" methods require students to relate a symbol directly with an environmental event rather than indirectly through the association of the equivalent symbol of the first language. The direct method, therefore, is analogous to coordinate training as the indirect method is to compound training. It was at this point we felt it wise to use closely controlled experimental methods to study the comparative merits of direct and indirect methods of training.⁴³ For this purpose, we followed the tradition of experimental research on verbal learning, as covered in such work as McGeoch,⁴⁴ and Underwood and Schulz.⁴⁵ Actually, the problem of direct and indirect methods is an old one and has been examined many times in the early 1900's by psychologists and educators. We improved on their procedures, we believed, and found that the direct method was relatively more efficient, at least for vocabulary learning, primarily because the task of associating new language words with referents (the direct procedure) afforded greater distinctiveness of elements to be learned than did the task of associating new language words with their equivalents in the first language. However, in a recent investigation of advanced students of a second language studying the language for a concentrated six-week period in a setting that was as "direct" as one could hope for, it was found that those students who kept their two languages functionally separated throughout the course did poorer in their course work than did those who permitted the semantic features of their two languages to interact.⁴⁶ Thus this study indicates that students studying under a direct method utilize the semantic features of both their languages and permit the two to interact and that this tendency toward linguistic interdependency apparently assists students in acquiring their second language. This finding

may well prompt further research on the question of direct methods of training.

A current study is examining the merits of learning two languages concurrently from an early age, in contrast to learning one language well before the second is attempted, i.e. learning two languages consecutively.⁴⁷ This problem is often faced by educators and parents who fear that confusion will accompany the early introduction of a second language before competence is developed in the first. Lack of information on this point makes most parents cautious and children are often kept away from a second language until, inadvertently, it may be too late to learn it well. Our approach in this study is to approximate the real-life situation using artificial languages and restricting ourselves to the vocabulary acquisition phase of the process. The study will be completed during the year.

Finally, we have examined the question of the intellectual deficit which is supposed to plague bilinguals. Many studies in the educational and psychological literature have concluded that bilingual children show a lower average score on tests of intelligence when compared with monolingual children who are supposedly matched on all pertinent characteristics except bilingual experience. The findings are not convincing when one surveys the total range of studies undertaken. Elizabeth Peal and I carried out a large study on this question last year with ten-year olds in Montreal.⁴⁷ We attempted to match very carefully the students who finally were categorized as bilingual or monolingual.

⁴³ Cynthia Wimer and W. E. Lambert, "The differential effects of word and object stimuli on the learning of paired associates." *Journal of Experimental Psychology*, 1959, 57, 31-36.

⁴⁴ J. A. McGeoch, *The psychology of human learning*. New York: Longmans, 1942.

⁴⁵ B. J. Underwood and R. W. Schulz, *Meaningfulness and verbal learning*. New York: Lippincott, 1960.

⁴⁶ W. E. Lambert, R. C. Gardner, H. C. Barik, and K. Tunstall, "Attitudinal and cognitive aspects of intensive study of a second language." *Journal of Abnormal and Social Psychology*, to appear in 1963.

⁴⁷ W. E. Lambert and Grace Yeni-Komshian, "Concurrent and consecutive modes of learning two languages." Research in progress, McGill University.

⁴⁸ Elizabeth Peal and W. E. Lambert, "The relation of bilingualism to intelligence." *Psychological Monographs*, to appear in 1963.

For example, we painstakingly checked on the socio-economic background of the two groups of students and made sure the bilinguals were really competent in both languages. Our results clearly show that the bilingual students are *far superior* to monolinguals on both verbal and non-verbal tests of intelligence. We concluded that the bilinguals may have an advantage in tests requiring "cognitive flexibility" due, perhaps, to their being bilingual. Miss Peal is presently examining this possibility more carefully. Because our results are in conflict with so many others on this point (although we have no doubt at all about the differences in intelligence just mentioned) we are not yet sure that this bilingual advantage is peculiar to bilinguals in Canada or to those who are actually "good" bilinguals. Our confidence in the generalizability of these findings for different settings will depend on more careful re-examinations in those settings where a bilingual deficit has been reported in the literature.

McGill University is but one of the centers studying bilingualism. The extremely important work of Susan Ervin at the University of California, Berkeley, would be of particular value to language teachers.⁴⁸ Her intriguing analysis of personality and value changes taking place when bilinguals switch from one language context to another makes evident the important role second-language learning can have in the lives of students.

⁴⁸ Susan Ervin, "The verbal behavior of bilinguals: the effects of language of response upon the T.A.T. stories of adult French bilinguals." *American Psychologist*, 1955, 10, 391. See also "Language and T.A.T. content in bilinguals," *Journal of Abnormal and Social Psychology*, 1963, in press.

Susan Ervin and C. E. Osgood, "Second language learning and bilingualism." In C. E. Osgood and F. Sebeok (Eds.), "Psycholinguistics." *Journal of Abnormal and Social Psychology*, Supplement, 1954, 49, 139-146.

Susan Ervin, "Language and recall in bilinguals." *American Journal of Psychology*, 1961, 74, 445-451.

Susan Ervin, "Semantic shift in bilingualism." *American Journal of Psychology*, 1961, 74, 233-241.

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ABSTRACT 1965

During the past ten years, a small research center has developed at McGill for the study of various aspects of language, language learning, and bilingualism. The group, consisting of undergraduate and graduate students, research assistants and associates, and staff members, has conducted programmes of research following several quite distinct lines.

Our earlier work on different forms of bilingualism was continued this year with a fuller analysis of research (presented in the 1964 report) on the characteristics of various methods of learning artificial vocabularies. In particular, attention was given to the relative advantages and disadvantages of learning two vocabularies in a concurrent in contrast to a consecutive learning order, and to the effect of variations of these major methods on efficiency of learning. The results indicate that the concurrent order groups take more trials to master the two vocabularies than the consecutive order groups, whereas the concurrent method has certain advantages with respect to immediate and delayed recall. These findings have both practical and theoretical implications for language teaching, language learning, and learning in general.

Another aspect of second-language learning, sound discrimination, was also investigated. The question was whether the ability to make sound discriminations at the high school age was a fixed ability, not subject to improvement, or, on the other hand, a learnable skill. Groups of subjects were given auditory training in discrimination of different sounds and their scores prior to this training were compared with their post-training scores. The results of a pilot study suggest that such training may be effective.

A major investigation was conducted this year dealing with the manner in which bilinguals manage or fail to keep their two languages functionally separate, i.e., how they attempt, but often are unable, to turn off one language, psychologically speaking, while the other is being used. Because the results of this series of studies are so promising, we may well make this a major area of further research.

Another line of our work has concentrated on the cognitive aspects and consequences of bilingualism, particularly the effects of bilingualism on intelligence and thought. An attempt was made to see whether those individuals who are skilled in two languages differ in their cognitive development from those who are skilled in one only. From studies with ten- and fourteen-year-old Montreal children, certain evidence suggests that bilinguals may be more advanced intellectually than monolinguals and have a more flexible approach to problem-solving. In these studies the monolinguals and bilinguals were carefully matched on relevant variables. Further studies of this general problem were conducted this year.

We have been interested in the psychological effects of variations in style of speech or accent on listeners, starting with a comparison of how residents of Quebec react to English versus French-Canadian and French-French styles of speech. The findings led to a theory of the stereotypes held by English and French-Canadians about each other. One study just accepted for publication extended this research to children and established that age and socio-economic class both affect the reactions to different guises of speakers. Another series of studies explored the effect of different types of experimental situations on the reactions of different groups of subjects to accented and unaccented speech. During the year, one of these studies was reworked and has been accepted for publication. We plan to conduct several new studies on this general problem during the coming year.

One of our major research efforts has been concerned with the changes of meaning that take place when symbols are used repeatedly. This phenomenon is referred to as "semantic satiation" and a large number of our research studies indicate the importance of satiation in learning, memory and thinking. This topic of study has implications for theories of language and thinking, and practical applications for those using drill and programme techniques in teaching languages. Recent studies in this area investigated the effects on satiation of (a) varying the amount of repetition, (b) rating the sound rather than the meaning of the words, (c) delayed versus immediate ratings, etc. No further studies were conducted on this problem during the past year.

A recent new approach is concerned with the associational responses of English and French Canadian monolinguals and of bilinguals, comparing these with European French and American word association norms established by other researchers. The results shed light on the potential difficulty English and French Canadians may have in communicating basic ideas and concepts with one another and how bilinguals can be of use in improving the interchange of ideas from one cultural group to another.

This year, we have started an examination of the French-Canadian's use of "tu" and "vous" when speaking with close family members. In contrast to those European settings where this linguistic difference in familiarity can show itself (such as in Italian and Spanish as well as French) and where there is typically a symmetrical reciprocal use of "tu" in family relations and "vous" with those

less intimate, we have found cleareut instances of non-reciprocal usage (e.g. parents using "tu" with children but requiring them to use "vous") among certain social classes in French Canada. We plan to give greater attention to this rather unique and interesting phenomenon in the coming year.

This year we have also started several studies of a purely psycho-linguistic nature, as will be evident in the summaries to follow.

In 1965, the following theses, supported in major part by D.R.B. funds, were submitted:

1. G. Richard Tucker, Jr. The nature of English pluralization rules of kindergarten children. M.A. thesis, August, 1965, McGill University.
2. Helen Grace Yeni-Komshian. Some training procedures applicable to teaching the sound systems and vocabularies of foreign languages. Ph.D. thesis, August, 1965, McGill University.
3. Malcolm S. Preston. Inter-lingual interference in a bilingual version of the Stroop color-word task. Ph.D. thesis, September, 1965, McGill University.

The following articles appeared since the last annual report:

1. Lambert, W.E., Anisfeld, Moshe, and Yeni-Komshian, Grace. Evaluational reactions of Jewish and Arab adolescents to dialect and language variations. Journal of Personality and Social Psychology, 1965, Vol. 2, No. 1, 84-90.
2. Kanungo, R. and Lambert, W.E. Effects of variations in amount of verbal repetition on meaning and paired-associate learning. Journal of Verbal Learning and Verbal Behavior, 1964, Vol. 3, No. 5, 358-361.
3. Anisfeld, Elizabeth and Lambert, W.E. Cognitive aspects of bilingualism. Paper delivered at AAAS Symposium on Bilingualism, Montreal, 1964.
4. Anisfeld, Elizabeth, and Lambert, W.E. Paper written for the Working Committee on Bilingualism of the Northeast Conference of Language Teachers. April, 1965.

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The research to be summarized below was carried out by a group comprised of (a) one faculty member, Lambert, who was on leave from McGill for the year but continued directing two doctoral dissertations, those of Yeni-Komshian and Preston, and conducted several studies while away, one on the "tu-vous" problem and one on bilingual interference with Preston; (b) another faculty member, Dr. Moshe Anis-

field, who directed the M.A. thesis of Richard Tucker and worked with several other undergraduate students on projects presented here; (c) a full-time research associate, Dr. Elizabeth Anisfeld, half of whose salary was paid by D.R.B. funds; (d) two advanced graduate students, Dr. Grace Yeni-Komshian who was working elsewhere but completed her doctoral work, and Mr. Malcolm Preston, and (e) several undergraduate honors students, - Ruta Semogas, Stephen Cohen, Miriam Zylberstein, Howard Blanchette, Gisele Stahlberg, Rosanne Bactz, Ken Williamson.

Study 1. Judgmental studies of the interrelations between two phonemic systems.

(Elizabeth Anisfeld, Moshe Anisfeld, Ruta Semogas, and Stephen Cohen)

What are the relations between two languages co-existing in the mind of one speaker? Are they isolated and independent from each other? Or do they compete and interfere with each other's activities or perhaps even aid each other? Anecdotal observations suggest affirmative answers to each of these questions. Bilinguals are demonstrably able at will to switch on one of their languages and switch off the other. But frequently they can not hide traces of one language when using the other. Finally, we are often impressed by the insights of bilinguals into the fine workings of both their languages.

The global task for research is to describe systematically the possible interrelations among two or more languages spoken by one individual and to determine the conditions responsible for their realization. This is a mammoth undertaking and we decided to tackle a tiny part of the problem: the cross-influences between two phonemic systems as expressed in judgmental responses. Languages differ not only with respect to the set of phonemes employed but also in the sequences of phonemes sanctioned. For instance, if one wanted to coin a new word in English, /thrub/ might be a candidate, but /srub/ would not, because the sequence /sr/ does not occur in the initial position in English. Presumably, speakers unknowingly internalize such patterns inherent in their language. With respect to the abstraction of such patterns by bilinguals, the question arises: Are the phoneme-sequence rules that a bilingual develops for one of his languages influenced by the other language? And if so, in what way? Two studies were conducted in Montreal on this problem - one with a group of 24 Lithuanian-English bilinguals, and the other with 24 English-Hebrew bilinguals. Each study contained a comparable English monolingual group. The Lithuanian and Hebrew Ss constituted distinctly different types of bilinguals. For the Hebrew Ss, English was the primary, and in most cases the native, tongue, and Hebrew was acquired to a moderate level of mastery in the all-day Hebrew school where they were tested. These Ss were grade 10 students. The Lithuanian Ss were much older (mean age 35 years) and Lithuanian was their native tongue which they acquired in the home surroundings. About half of these Ss learned Lithuanian in its natural environment before immigrating to Canada. The Hebrew Ss can be characterized as coordinate bilinguals, i.e., bilinguals who have learned and used their two languages in different milieus, whereas the Lithuanian Ss are relatively more compound bilinguals in that they tend to use the two languages in similar contexts.

Four sets of two-phoneme sequences were selected for each pair of languages: (a) sequences permissible in language A and not in language B (coded AB-), (b) permissible in B and not in A (BA-), (c) permissible in both (AB), and (d) permissible in neither (A-B-). For instance, the sequence /ml/ occurs in Hebrew in initial position but not in English (HE-), /fl/ in English and not in Hebrew (EH-), /gl/ in both (HE), and /thl/ (th pronounced as in thin) in neither (H-E-). There were five or six items in each set. These biconsonant sequences, with a constant shwa ending appended to make them pronounceable, were tape-recorded by trained phoneticians. The tapes were played for the Ss (in small groups) who were asked to judge each sequence concerning its actual occurrence in one of their languages. After completion of this task Ss were asked to do the same for the other language. Other tasks performed before these had already provided acquaintance with the sequences. The Ss were required to answer the question "Does this sound occur in the beginning of an English (or Lithuanian) word?" on a five-point scale ranging from "definitely no" to "definitely yes".

If the two languages are completely independent, occurrence of a sequence in one should not affect its judgement in the other. The results of both studies clearly reveal cross-influences, but the influences differ from one group of bilinguals to the other. The Lithuanian group showed interference from English to Lithuanian and from Lithuanian to English, although the latter effect was less pronounced (but still significant beyond the .05 level). They judged the LE sequences as Lithuanian with greater confidence than the LE- sequences, and rejected the EL- sequences as non-Lithuanian less emphatically than the E-L- sequences. The pattern for occurrence in English was similar. EL was judged with greater confidence as occurring in English than EL-, and L-E- with less confidence than LE-. In comparison to the English monolinguals who showed no differences in their judgments of occurrence of these phoneme sequences in English, these results indicate that, in making judgements about one language, the Lithuanian bilinguals were not able to free themselves from the effects of the other language. In contrast, the Hebrew bilinguals appear to be aided by their knowledge of the two languages. When asked to evaluate occurrence in English, the Hebrew Ss more decidedly rejected the HE- biconsonants than the H-E- biconsonants, and similarly in judging occurrence in Hebrew rejected with greater certainty HE- than H-E-. Thus the contrast, occurrence in one language and non-occurrence in the other, appears to serve as an additional aid for the Hebrew Ss. It is as if the Hebrew S was saying to himself: I can't think of words beginning with these sounds in English (or Hebrew), and I'll safely judge that it does not occur in English or Hebrew if it occurs in Hebrew or English. The occurrence of a sequence in both languages, however, did not affect the judgements of these Ss for one of the languages. The differences between the two bilingual groups can be understood in terms of the compound-coordinate distinction developed at McGill.

Study 2. Monolingual-bilingual differences in two cognitive tasks.
(Miriam Zylberstein and Elizabeth Anisfeld)

Previous studies have indicated that bilingual individuals may

differ on certain cognitive abilities from monolinguals. The present study was designed to investigate one such ability--mental flexibility--suspected to differentiate monolinguals from bilinguals. Two testing situations were selected that were thought to require mental flexibility, and the performance of monolinguals and bilinguals in these situations compared. The first situation was the standard group intelligence test and the second, a transfer of training condition.

Standard group intelligence tests may be divided roughly into two types. One type, Whole, is comprised of several different types of items measuring different cognitive abilities, but these items are all interspersed. e.g., The first item may be verbal analogies, the next arithmetic, the third perception, etc. The test is administered as a unit. Another type of test, Grouped, has similar items to the Whole type but they are grouped together into subsections containing all the same type of items, e.g., seven verbal analogies items, which are administered one after the other. It was argued that the Whole type test requires more mental flexibility than the Grouped type, since one must continually switch from one type of problem to another. Whereas, in the Grouped situation, one can set oneself to solve a certain type of problem and work for a certain period of time on the same track. This seems to require less switching or flexibility on the part of the student. We therefore decided to take the same test and make two forms from it--one with the items in the Whole form and the other Grouped. It was thought that the Whole version would be harder and therefore would yield lower IQ scores than the Grouped for monolinguals. However, for bilingual individuals who may have developed more mental flexibility there might be no difference between the two forms, since their skills in switching would help them on the Whole.

The second situation explored in this study was a transfer of training situation. Experimental groups were given practice on a Number Series test. From previous studies using this situation, it was thought that the amount of transfer should be proportional to initial level of intelligence. In addition, it was argued that the postulated flexibility skills of the bilinguals should give them an advantage in this test.

The subjects were grade seven school children from four schools of the Protestant School Board of Montreal. Tests of bilingualism administered all the grade seven children yielded 44 balanced French-English bilinguals. Forty-four monolinguals were selected so as to be equal to the bilinguals on both Henmon-Nelson IQ and the Raven Progressive Matrices (a nonverbal intelligence test). Both the monolingual and bilingual groups were further subdivided into two groups for purposes of experimental design and all four groups had similar mean HN and Raven scores.

The results indicated that, with order of presentation balanced for, there was no difference between performance on the Grouped and Whole for either monolinguals or bilinguals. This enabled us to combine the Whole and Grouped scores for monolinguals and bilinguals separately and examine the effect of order of presentation of the test.

One would expect an increase in IQ of approximately four points when an alternate form of the same IQ test is administered a week later. That is, you would expect a significant increase in IQ from the first testing to the second. This was indeed found for the monolinguals, as expected. The practice on the first test resulted in an increase in mean IQ of approximately four points. However, the bilinguals did not show any increase in IQ from first to second testing. Their mean IQ at both sessions was almost identical. Further examination of these results reveals that the IQ of the bilingual group in the first session was much higher than that of the monolingual group. The monolinguals improved with practice in the second session to the initial level of the bilinguals. It thus appears that the bilinguals are operating at their fullest capacity in the first testing. They are drawing upon abilities which are already developed and stable, and consequently practice has little effect on their performance. However, the monolinguals are still in the process of developing the abilities required in this situation and thus they start lower and increase with practice. Support for this interpretation comes from an examination of the HN scores of these two groups. The HN test was given several years ago. The mean IQ score of the monolinguals on the HN and on the first testing now do not differ. However, the bilingual mean IQ increased significantly from the earlier HN to the first test given now, indicating that in the interim they have developed their abilities to a stable level, which does not change with practice.

The results of the transfer test lend themselves to a similar interpretation. When all IQ levels are combined, no significant differences are found between the performance on the Letter Test of the control and experimental groups for either monolinguals or bilinguals. When the subjects are divided into High, Medium, and Low intelligence groups on the basis of their Raven raw scores, some interesting differences do emerge. Due to the small number of subjects in each cell, none of these differences reach significance. However, they can be taken as suggestive. The high and medium bilingual groups show a small but similar amount of positive transfer. The low Raven score group shows no transfer at all. On the other hand, the high and low monolingual groups show much more positive transfer, whereas the medium group shows none whatsoever. This is not the expected pattern of transfer results for monolinguals and led us to consider the effects of age. The subjects were divided into high, medium, and low IQ groups once more, this time on the basis of their Raven weighted scores, which take into account age. When this was done, the results for the monolinguals yield the expected pattern of transfer, with some positive transfer for the low group, more for the medium group, and even more for the high group (i.e., amount of transfer proportional to IQ). However, the re-grouping of subjects taking into account age did not alter the picture for the bilinguals. There was still no transfer for the low group and moderate but equal amounts of transfer for the medium and high groups. This seems to indicate once again that the bilinguals have already developed the necessary ability and there is little room for improvement with practice or with increase in age. The monolinguals, on the other hand, are still in the process of developing the necessary skills, and age is an important variable. They do benefit from practice in proportion to their weighted-by-age IQ.

Study 3. The Miller Analogies Study.
(Elizabeth Anisfeld and June Chaikelson)

The suspicion has often been expressed that non-native speakers are handicapped on the Miller Analogies Test, which is extensively used for the screening of students for admission to graduate study. A pilot study was undertaken to investigate this problem. A questionnaire was devised to determine the extent of each individual's knowledge of and experience with English and any other languages he knows. This questionnaire was administered to all students who wrote the Miller Analogies Test at McGill in the Spring of 1965. On the basis of the information received on the questionnaire, the subjects were divided into six different groups, differing in their knowledge of English and other languages. The mean scores of each of these groups on the Miller were compared with each other. The items on the Miller were tentatively subdivided into seven different types of items and the mean scores of each group on these seven subdivisions will also be compared. The data are still being analyzed, but preliminary results indicate that there are significant differences between the different bilingual groups on some of the subdivisions and on the total score.

Study 4. The nature of English pluralization rules of kindergarten children.
(G. Richard Tucker)

The principle series of experiments was conducted to investigate the nature of the kindergarten child's productive and receptive control of English pluralization rules. His control of standard adult rules was studied by using various Production and Recognition tasks which paired nonsense-syllable names with cartoon-animal pictures. The child (in Production tasks) was told the name for a single figure ("This is called WAF") and required to produce the plural (WAFS); and vice versa. Children made many errors with syllables which require the addition or deletion of the /iz/ allomorph of plurality such as in the nonsense word PASH, PASHES; or the word glass, glasses. They made fewer errors with syllables requiring either /s/ such as WUK, WUKS (or cat, cats) or /z/ WUG, WUGZ; (dog, dogs). The child is exposed to relatively few words whose plural ending is /iz/; and consequently, he does not gain so much experience with words of this type as with those which end with /s/ and /z/.

A different pattern of errors was found in the Recognition tasks where the child had to match names with pictures. For instance, in one of the recognition tasks he was shown a singular (or plural) picture and asked whether he would rather call that picture WUG or WUGS. In all Recognition tasks, fewer errors occurred with words whose plural is the /z/ sound than with either of the other two endings of plurality. Successful performance depends on the child's ability to recognize plural endings. The allomorph /z/ is a more reliable marker than /s/ since most nouns ending with a final /consonant +z/ are plural (flags, dogs); whereas many nouns ending with a final /consonant +s/ are singular (tax) as well as plural. Performance with /iz/ forms was hampered by the fact that singular forms of these words also look like plurals to the child (glass has an /s/ ending).

Other studies indicated that the child also uses special all-inclusive rules to supplement the standard adult rules that are acquired with increased linguistic experience. For instance, in one study, young children used numbers rather than the standard phonemic markers to indicate plurality. They would say, for instance, two PASH or one ZAHIS. Responses of this type were more prevalent with younger, linguistically inexperienced children. Another series of studies suggested that the child has abstracted the general rule that plurality involves lengthening the singular form. For instance, if the child is shown a picture of an animal labeled MARK, and then asked whether he would call the plural form MAR or MARKREN he invariably picks the longer name as the plural. Other studies revealed that the young child may use stimulus-response correspondences to classify words into singulars and plurals. If the child is required to squeeze a balloon one time when he hears a singular word and several times when he hears a plural word: he performs better than when he is required to squeeze a balloon of one color for the singular word and a balloon of another color for the plural word.

The child's pluralization rules depend upon both special rules which he uses; and standard adult rules which he acquires gradually with linguistic experience.

Several other peripheral studies were also conducted with kindergarten children. It was attempted to "set" children to free associate to singular and plural nouns so that they must respond to a singular noun with any other singular noun and a plural noun with any other plural noun. No explicit directions were given; but the child was provided with several examples. Children could be set to respond appropriately, at least to some limited degree. This "set" contradicts the child's normal tendency to respond to noun stimuli with completion type responses (man ... works).

Another study investigated the effects of stimulus binding on children's rhyming tasks. Several familiar words (hat, pail, fish) were chosen and transparent slides depicting these words were made. A group of pictures of rhyming words was also made (rat, nail, dish) as well as a group of pictures of unrelated words (apple, wagon, lamp). As one of the original familiar words was said, the child was shown a picture from one of the three groups, stimulus word, facilitating word, or unrelated word, and he was instructed to think of a rhyming word. When the pictures were unrelated to the rhyme that the child had to make, his performance deteriorated sharply. This deterioration indicated that stimulus binding might have prevented him from performing efficiently on this task.

These complementary studies all help to define some aspects of linguistic and cognitive ability of young children. They focus, especially, on the nature of the child's concept of singularity-plurality.

In addition, a separate series of studies was conducted with groups of French-English bilinguals, to investigate some effects of Delayed Auditory Feedback on their speech in primary and secondary languages. Some previous work had indicated that an artificial delay

between the time of phonation and return of feedback to the speaker's ear might cause a greater disruption in the speech of a person speaking his primary language than his secondarily acquired language. Previous findings were not confirmed; but the subject populations were quite different in the two series of studies and this difference may account for the discrepant findings. A further study of any differential effects of Delayed Auditory Feedback on speech of bilinguals might provide more information about the relation between thought and speech processes in this subject population.

Study 5. Training procedures for developing perceptual skills in the sound system of a foreign language.

A similarity between the auditory skills required to decode the sound system of a foreign language and those measured on aptitude tests having an auditory component was noted. This raised the question of whether training in auditory perceptual skills such as discrimination, identification and sound-symbol association would facilitate learning the sound system of a new language. It was not possible to examine this question directly with actual language learners, consequently an indirect approach was adopted. It was reasoned that since aptitude measures predict future achievement, an increase in aptitude scores attributable to training would most probably be reflected in improved achievement. The experiment was designed to investigate whether the auditory abilities measured by language aptitude tests can be modified by training.

All Ss were given a set of language aptitude tests (subtests from the Modern Language Aptitude Test and tests designed by Paul Pimsleur) after which the experimental Ss received two hours of training in auditory perceptual tasks, and finally all groups were compared on gains in aptitude test scores. The Ss were native English speakers who knew no other language except for the French they were studying in High School. The training sessions for the experimental groups consisted of a series of practice exercises each followed by a test on the material covered. The control group did not receive any training. During the training sessions, experimental Ss were provided with training in auditory discrimination where they were asked to listen to minimally contrasting and unfamiliar speech sounds and decide whether they sounded the same or different. They were also trained in identifying a critical speech sound and in detecting pitch variations. Finally, they were provided with an exercise in sound-symbol association. The Ss were also exposed to a variety of unfamiliar speech sounds, these being the context in which the critical sounds were presented. The training exercises differed from the aptitude tests in format, and sample of speech sounds. One experimental group received immediate confirmation of results during the training sessions and the other was given the correct answers after every block of ten items.

The results offer preliminary indications that such training administered prior to language instruction would aid the student in learning the sound system of a foreign language. These findings were primarily observed in Ss with fairly high initial aptitude scores who were trained with immediate confirmation of results. The Ss trained with delayed confirmation of results did not differ from

the control groups. The training provided for the experimental Ss was very limited in the sense that it lasted only for two hours, and it is reasonable to assume that Ss initially good in auditory perceptual tasks benefit more from a short training program than those less skilled. Subsequent studies should vary the amount of training to arrive at optimum amounts for different ability groups.

Although the conclusions from this study are subject to future substantiation, it is suggested that training in auditory perceptual tasks such as discrimination, identification and sound-symbol association will help the language learner in the acquisition of the sound system of a foreign language. It is suggested that the prospective language learner can be trained to process and code novel speech sounds efficiently. That is, students can be trained to recognize critical sound differences and to organize novel speech sounds in a manner that would facilitate the retention of these speech sounds. It is important to note that the sound system of the target language should be considered in selecting the speech sounds for training, since it would be undesirable to train students in certain sound distinctions that are not critical (phonemic) in the target language.

Study 6. Training procedures for teaching two contrastive vocabularies.

(Grace Yeni-Komshian and W.E. Lambert)

This study is an experimental analogue of the acquisition of two contrasting vocabularies (two symbols to one referent) in which different concurrent and consecutive orders of training procedures are evaluated. The aim was to compare the difficulty encountered in learning, and the quality of retention, in each of these different training procedures. Concurrent training procedures require S to learn two vocabularies in a condition which presents contrasting items in close temporal contiguity, thereby increasing the possibility of interference during learning. Consecutive training procedures present the two vocabularies in temporally separate sequences so that training on one vocabulary is completed before the second vocabulary is introduced. In this condition, S is less likely to be faced with interference during the training period. Contrasting items are operationally defined as two symbols, each representing a vocabulary, associated with one referent. Four different concurrent learning conditions and two consecutive conditions were investigated.

Concurrent groups:

(a) Random. The Ss in this group were presented with items from the two vocabularies in a random order. The Ss could not predict the vocabulary of the subsequent item on their learning lists.

(b) Alternate. In this group, Ss alternated between a set of items from one vocabulary followed by their glosses in the second vocabulary. Because of the systematic alternation between vocabularies, the Ss in this group could predict that they were going to get a set of items from the same vocabulary for a period of time. This mode of presentation provided the largest temporal separation between the glosses of the two vocabularies among the concurrent order groups.

(c) Glosses-RBBR. The vocabulary items for this group were presented in a sequence of glosses. That is, each item was followed by its counterpart in the other vocabulary. The sequence followed a double alternation pattern. The Ss could not easily predict the vocabulary of the subsequent item. This method provided Ss a fairly systematic mode of presentation with a small temporal separation between the items of the two vocabularies.

(d) Glosses-BRBR. This condition was very similar to the preceding one except that the presentation sequence followed a simple alternation pattern. The Ss in this group were able to predict the vocabulary of the subsequent item during the learning period. This method had the most systematic sequence of presentation among the concurrent order groups, and it also provided a small temporal separation between the glosses of the two vocabularies.

Consecutive groups:

(a) Successive. The Ss in this group were presented with the first vocabulary until they reached mastery; they were then trained on the second vocabulary. The approach for this group and all the preceding groups was an approximation of the direct method of language instruction, where Ss were always presented with the referent.

(b) Indirect. This group differed from all the others in that Ss learned the second vocabulary indirectly through their knowledge of the first vocabulary. This method was an approximation of the indirect method of language teaching which relies heavily on translation.

All Ss were given the same series of immediate and delayed tests of retention.

The results indicate that fewer trials are required to reach mastery when Ss were presented with each vocabulary separately with non-contrasting items, as in the consecutive order groups, than when contrasting items were presented in close temporal order, as in the concurrent order groups. Furthermore, the speed of learning in the concurrent order groups was positively related to the predictability of the vocabulary of the subsequent item during learning. However, when the speed of learning and quality of retention on immediate and delayed retention tests are taken into consideration, the training procedures for the Glosses-RBBR group appears to be the most effective among the six learning conditions investigated.

The Ss in Glosses-RBBR learned the two vocabularies concurrently, and consequently encountered interference between contrasting items during acquisition, especially during the first part of the learning period. During the second period, the number of trials to criterion and errors due to interference between the two vocabularies were greatly reduced. Actually, during the second period, they did not differ significantly from the consecutive order groups. Unlike the Ss in the Glosses-BRBR and Alternate

conditions, Ss in Glosses-RBBR had to be alert to the cue which differentiated between the two vocabularies since they could not predict the vocabulary of subsequent items on their learning lists. Thus the learning condition for Glosses-RBBR can be characterized by contrasting items organized in sequence of glosses, wherein Ss had to be alert to the cue which differentiated the two vocabularies. It is suggested that the co-occurrence of these features in the Glosses-RBBR condition explains why this group did not require as many trials as some concurrent order groups and was superior in retention.

By having contrasting vocabulary items during the learning period Ss were forced to respond to the stimulus element which signaled each of the two symbols to be associated with one referent. This suggests that Ss in the concurrent order groups were engaged in discrimination learning as well as in forming symbol-referent associations. Discrimination learning was more effective when the contrasting items were presented sequentially as in the Glosses-RBBR and Glosses-BRBR groups. These groups had fewer reversal errors on retention tests than any other group. The Alternate group had very few instances where they could compare the contrasting items sequentially, and had almost as many reversals as the consecutive order groups which had no occasion to make such comparisons.

The results suggest that interference during learning is not necessarily detrimental if the training is such that overcoming the interference is part of the learning procedure. It is suggested that Ss were able to overcome interference by learning to discriminate between the contrasting items especially when they could compare them sequentially. However, it is also emphasized that mere exposure to contrasting items with no provisions for discrimination between them, as in the Indirect group while learning the second vocabulary, is conducive to errors of interference on retention tests. The Indirect group had more reversal errors than any other group.

Finally, provisions for close comparison between contrasting items with the requirement of alertness to the cue which signaled each vocabulary appears to produce a difference in retention. Because of the regular sequencing of items, Ss in Glosses-BRBR did not have to be as alert as those in Glosses-RBBR. On retention tests, Glosses-BRBR consistently had fewer correct items than Glosses-RBBR.

Although the learning conditions investigated are analogues of extreme positions that differ in many ways from actual vocabulary learning, the results of this study demonstrate the advantages of incorporating discrimination learning and alertness to critical cues when contrastive material is being taught.

Study 7. Inter-lingual interference in a bilingual version of the Stroop color-word task.

(M. Preston and W.E. Lambert)

It is an interesting psychological phenomenon that bi-

linguals communicate so freely in either language with relatively little interference from the other. One way of exploring this problem is to determine to what extent one can produce interference in a set of processes functioning in one language by structuring the stimulus situation so as to encourage the operation of another potentially interfering set of processes in the other language.

A situation which seemed likely to create the required conditions is the Stroop color-word task which presents a subject with conflicting demands--to call off the names of colors of inks used in the printing of words, when the words themselves are the names of colors. On the typical stimulus card, one hundred color words are arranged in ten rows of ten. The words are printed in one of four different colors. For instance, the word RED may appear in blue, green or brown ink but never in red ink. The task is to name the colors of the inks of the words. Thus, the problem is to not let the color words impinge on the requirement of naming the colors of the inks. The time taken to name the colors of words is considerably increased over the time to name the colors on another card consisting of just rows of colored patches, with no interfering words.

Predictions about the various patterns of the six time (and error) scores were made from a simple information processing model. For naming the colors of objects this model postulates three processes organized sequentially: a color activating process, a label searching process and a motor process. For reading words, on the other hand, the model postulates two processes also organized sequentially: a label activating process and a motor process. It is assumed that the word reading system is a highly efficient one relatively because of its greater usage -- that is, one tends to read words when encountered, either silently or aloud, more automatically than one is likely to name colors when encountered.

A fast errorless performance on the color-word task requires that the wordreading system be inoperative. However, because of its assumed automatic character, presumably a certain amount of interference between the word reading system and the color naming system will occur. A selective process is postulated which permits the color naming system to operate at the same time as it inhibits the word reading system. It is assumed that this process functions more efficiently when the two competing systems are processing different sorts of material.

The first experiment (using monolinguals) was designed to test two predictions based on this model: (1) non-color words like house or bird should cause less interference than color words like red or blue since interference is less likely to occur between the color naming and word reading systems when one is dealing with colors and the other is dealing with non-colors than when both systems are dealing with colors, (2) low frequency words should cause less interference than high frequency words since the word reading system should function less efficiently with low frequency words and thus interfere less with the color naming system. The results of the first experiment found strong support

for the first prediction and moderate support for the second.

In the second study, "balanced" bilinguals were employed. Balance or equivalence in skill was determined by a careful selection procedure based on background language history and by performance on the patch cards. Only bilinguals who showed relatively little difference in time to name the colors of the patches in the two languages were used. The prediction was that less interference should occur when response and interfering languages were different (words in language A and response in language B) than when the two languages were the same. Thus, the word reading system should interfere less with the color naming system when one system is caught up with one language while the other is set for the second language.

The prediction was not confirmed when the translations of the words in the two languages looked and sounded similar, for instance, brown-braun or blue-blau. When the translations had different stimulus characteristics (black-schwarz or yellow-gelb) the prediction was upheld. However, even in this case, the word cards took significantly more time than the patch cards. In addition, when the translations had different stimulus characteristics, the most frequent error when response and interfering languages were different was the translation of the printed word.

The third experiment examined the performance of "dominant" bilinguals. Dominance was determined by language background and time to name the patch cards in the two languages. Only bilinguals who showed a considerable difference in time to name the patch cards in the two languages were used as subjects. These subjects were students at Stanford University and were either undergraduates or graduate students studying French. It was predicted that there should be less interference when response language was English and the interfering language was French compared to the three other word card situations (both languages either French or English, or response language in French and interfering language in English). The three other possible comparisons were situations in which the relevant factors operating worked in opposing directions and thus predictions were less clear cut.

Another variation was introduced in this experiment. This variation involved naming the colors of non-color words. There were two non-color word cards, one in French and one in English. These cards were each responded to in both French and English. The predictions were the same as for the color word cards except that it was felt that the non-color word cards would exhibit lower time scores, in general, than the color word cards. The predictions for both color word cards and non-color words cards were confirmed.

The results from this set of studies suggest that in the bilingual version of the color-word task, one cannot automatically inhibit one language system while functioning in the other. Thus in this one case, artificial as it may be, there is little evidence for a bilingual switch as Penfield suggests. If the interfering words do not have translations with similar stimulus characteristics, the interference will be slightly less when response and

interfering languages are different for "balanced" bilinguals. The fact that a very common error in this situation is the translation of the printed word suggests that the interference occurs via a translation process. Finally bilingual dominance also affects the pattern of scores in the bilingual color word task. The easiest task is that in which the dominant language is the response language and the non-dominant language is the interfering language.

Study 8. Inter-language comparisons of associational structures.
(W.E. Lambert and Nancy Moore)

As reported last year, word association norms were established for three groups of students: monolingual English Canadians, monolingual French Canadians, and English-French bilinguals who gave associations both in French and in English. Associational norms were constructed for each of these groups and they were compared with established norms for American and European French students. Our analyses this year have led to the following notions.

Because we are as interested in group dissimilarities of associational content as in the similarities, it will be helpful to realize how we interpret associational responses. We view them as distinctive connotative meaning networks, parts of which may be activated whenever their appropriate stimulus words are either decoded or are about to be encoded. The networks not only convey emotional significance but also direct the train of thought as particular stimulus words are encountered. This view is similar to that of Carroll who interprets word association responses as "some part of an assemblage of mediating processes" reflecting "the variety of experiences represented in a concept". The present view is also basically related to Deese's notion of "associative meaning." Deese noted that two words often do not elicit one another as associational responses yet they do have a great many associations in common. For example, samples of undergraduates gave the associations note, song, sound, noise, music and orchestra to both Piano and Symphony. Such words, he argues, have much associative meaning in common and are thus linked within some general concept. In the present case, the same or translated equivalent stimulus word may have the same or different associational meanings for different groups and when the associational systems are discordant, the social communication may be disrupted. For example, the English Canadian and Bilinguals in English gave the primary response God to the stimulus word Bible whereas the French Canadians and the Bilinguals in French gave livre (book) as their primary responses. In communication, the two monolingual groups could easily miss the full significance of one another's messages because such associational discordances color the meaning and shunt the line of associations off on quite different routes. In this example, the bilinguals would likely transmit the discrepancy with fidelity from one monolingual group to another, switching from one associational network to another as they change languages. The discordance would accumulate when sequence of ideas, as in sentences, are socially transmitted. For instance, one might want to relate the concepts Child, Sickness and Doctor. The primary associates to these words are: mother,

health and nurse for our English Canadian Ss and baby, hospital, sickness for the French Canadians. If bilinguals are used to transmit this message, additional distortion is likely since the primaries are mother, bed, sick for the bilinguals in English and baby, bed, sickness for the bilinguals in French.

Assuming then that these group differences in associational correspondence determine in part the difficulty or ease of communication both across and within linguistic groups, we can profit from a closer examination of the ratios of associational overlap. In view of the long-term tensions between French and English Canadians in Quebec, attention is first drawn to the relatively low correspondence between their associational networks (.51), much lower than that between English Canadians and Americans (.78). The communication of connotative significance between members of these groups might be improved through the bilinguals who have somewhat more associational similarity with themselves in their other language (.59) and who make better contact with each of the monolingual groups, especially when using the same language as the monolinguals (Bilinguals in English and English Canadians = .61; Bilinguals in French and French Canadians = .68) but also when using the other language (Bilinguals in English and French Canadians = .57; Bilinguals in French and English Canadians = .56). The bilinguals are potential sources of rapprochement between these two relatively discordant monolingual groups and they might be used as linguistic mediators to help prepare, transmit and receive messages from one group to the other.

The discordance in the networks of the English and French Canadian monolingual groups might also be improved on if the French Canadians were to move toward the American pattern (equivalence of primaries for the French Canadian and Americans is .45 compared to the .78 for the English Canadian and American groups). Since the associational pattern of the French Canadian group is relatively isolated from all of the others, French Canadians may realize their difficulty in expressing the full meaning of their ideas and thereby sense a certain pressure to adjust to either the English Canadian and American pattern, or at least the French French pattern.

Finally, the English Canadian associational contact with the French French (.46) could be made worse by the use of Bilinguals in English who have relatively low equivalence of primaries with the French French (.33). The distortions would come mainly from transmitting messages from the English Canadian monolinguals to the Bilinguals in English, but even then the relay of the message through the bilinguals' French would not likely be good (Bilinguals in French and French French = .45). Possibly English-French bilinguals from France might be better mediators in this case.

These notions need the support of further normative studies with more careful selection of bilinguals who have demonstrable skill of equal power in both languages. If these norms are reliable, then laboratory investigations of bilinguals trans-

mitting and receiving messages in each of their languages could be attempted as a means of studying ease and difficulty of communication.

Study 9. The French-Canadian usage of "tu" and "vous".
(W.E. Lambert)

Some recent theorizing by Roger Brown at Harvard has concentrated on the use of speech forms such as "tu" and "vous" or their equivalents in Spanish, German and Japanese. One might consider these as verbal signifiers of different degrees of social distance or familiarity, or as indicants of status differences. Brown, using very limited samples of foreign students from France, has argued that there is little sign of any "non-symmetrical" usage of these signifiers nowadays, that is people in conversation no longer use one form (say "vous") and receive the other from their interlocutors. Brown traces various changes through history where non-symmetrical usage was common, especially when status differences (between army officer and soldier, or waiter and client) were evident. The trend is clear that status differentiation has given away to familiarity, leading to symmetrical usage of linguistic signifiers of this sort. It struck us that the French-Canadian usage is not in line, that there are many instances I know of personally where a child will use "vous" when talking to a parent and receive "tu" in the same conversation. We have started an investigation of this rather intriguing problem and, after a preliminary analysis of protocols from a sizeable sample of teenagers in Quebec City, there are clear-cut socio-economic differences apparent. The lower socio-economic class children - not the middle or upper, as one might expect on certain grounds - are very much more likely than the middle or upper class children to encounter the non-symmetrical situation. We are pleased with the significance levels of this finding and will continue the analysis and likely collect data at different age levels. This approach throws light on the matter of social control or some such phenomenon of keeping the child in place and guarding the adult authority. It also suggests some of the problems a lower class French-Canadian child may have in learning how to use his language, if, for example, as an infant he must from the start receive all verb endings from his closest linguistic models in the singular form and yet send or use the plural (less encountered) form in response. Our study will deal with many social contacts in the adolescent's environment, from peer relations to the more formal interactions with teachers, priests, etc.

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